

PHILIP MORRIS
SUBMISSION
ON
OSHA'S PROPOSED RULE ON
INDOOR AIR QUALITY

(59 FR 15968)

TEXT

AUGUST 11, 1994

2050239746

TABLE OF CONTENTS

2050239747

TABLE OF CONTENTS

Introduction	Tab 1
Legal Analysis of the Proposed Standard.....	Tab 2
Workplace IAQ and Significant Risk.....	Tab 3
ETS in the Workplace: Characterization and Exposure.....	Tab 4
Material Impairment: Lung Cancer.....	Tab 5
Material Impairment: Cardiovascular Disease.....	Tab 6
Material Impairment: Irritation.....	Tab 7
Material Impairment: Pulmonary Effects.....	Tab 8
Material Impairment: Reproductive Effects.....	Tab 9
Material Impairment: Genotoxicity.....	Tab 10
The Proposed Rule: Feasibility and Alternatives.....	Tab 11
The Building Systems Approach.....	Appendix A
Critique of Repace/Lowrey, 1993.....	Appendix B
Pharmacokinetic Modeling.....	Appendix C
References.....	Parts 1-5

2050239748

2050239749

SECTION I
INTRODUCTION

2050239750

INTRODUCTION

On September 20, 1991, OSHA issued a Request for Information on Occupational Exposure to Indoor Air Pollutants (56 FR 47892) (hereinafter "RFI") in an effort to obtain the necessary information to determine whether regulatory action regarding indoor air quality (hereinafter "IAQ") was appropriate. (56 FR 47892). The RFI sought information relating to the health effects attributable to poor IAQ, ventilation system performance, exposure assessments and abatement methods. Over 1,200 interested parties commented to OSHA in response to the RFI.

On April 5, 1994, OSHA published a Notice of Proposed Rulemaking on Indoor Air Quality (hereinafter "NPR"). (59 FR 15968) The NPR sets out the basis for OSHA's proposal to regulate IAQ as set forth therein, including occupational exposure to environmental tobacco smoke (hereinafter "ETS").

This submission sets forth and documents the positions of Philip Morris on the issues raised by the Notice of Proposed Rulemaking. These comments, which supplement the Philip Morris submission to the RFI docket, address issues including the scientific, legal, and practical aspects of OSHA's proposed rule. In general:

- The proposed standard fails to demonstrate that exposure to ETS in the workplace is associated with any significant material impairment of health.
- The analysis of risk is not scientifically sound.
- Significantly, OSHA fails to include measured ambient exposure data for ETS in its estimate of the risk allegedly posed by ETS in the workplace, despite the fact that such studies were available to OSHA.
- Contrary to scientific data and the legal mandate of Benzene, OSHA's proposed rule assumes, without support, that there is no safe threshold for ETS exposure in the workplace.
- The proposed standard is overly broad and unduly burdensome, legally unsupported, and impractical.
- The proposed standard fails to consider alternative approaches to overall indoor air quality, which would include and address ETS, such as the "building systems approach."

2

2050239753

SECTION II

LEGAL ANALYSIS OF THE PROPOSED RULE

2050239754

LEGAL ANALYSIS OF THE PROPOSED RULE

I. OSHA HAS EXCEEDED ITS LIMITED STANDARD-SETTING AUTHORITY IN THE PROPOSED STANDARD

A. OSHA's standard-setting authority is limited by the Occupational Safety and Health Act

In §§ 3(8) and 6(b)(5) of the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.) (hereinafter, "OSH Act" or "Act"), Congress established OSHA's standard-setting authority:

§ 3(8)

'Standard' means the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.^{1/}

To develop occupational safety and health standards about toxic materials or harmful physical agents, the Secretary of Labor shall

§ 6(b)(5)

set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.^{2/}

^{1/} 29 U.S.C. § 652(8) [emphasis added].

^{2/} 29 U.S.C. § 655(b)(5) [emphasis added].

The limitations that these provisions place upon OSHA's standard-setting authority were first interpreted by the United States Supreme Court in Industrial Union Department, AFL-CIO v. American Petroleum Institute, 448 U.S. 607, 65 L. Ed.2d 1010, 100 S. Ct. 2844 (1980) (hereinafter "Benzene").

B. The U.S. Supreme Court's interpretation of §§ 3(8) and 6(b)(5) of the OSH Act

In Benzene, a Supreme Court plurality held that in regulating toxic materials or harmful physical agents, OSHA's authority to promulgate such standards is governed by §§ 3(8) and 6(b)(5) of the OSH Act. As Justice Powell explained in his concurring opinion:

. . . [Sections] 6(b)(5) and 3(8) of the [Act] must be read together. They require OSHA to make a threshold finding that proposed occupational health standards are reasonably necessary to provide safe workplaces. When OSHA acts to [limit exposure to a substance], therefore, it must find that (i) [existing] permissible exposure levels create a significant risk of material health impairment; and (ii) a reduction of those levels would significantly reduce the hazard.

(Benzene, 448 U.S. at 664-665) [emphasis added]

Thus, as a threshold matter, to promulgate an occupational health standard, OSHA must initially follow a "two-pronged" test by: (1) reaching a threshold finding that the proposed standard is reasonably necessary to provide a safe workplace, by establishing that the existing workplace exposure to

the substance in question creates a significant risk of material health impairment; and (2) establishing that the standard's requirements, including the level of exposure permitted by the standard, are reasonably necessary to significantly reduce that significant risk.

Although the Benzene decision was a plurality decision, its holding was adopted by a majority of the Supreme Court in American Textile Manufacturer's Institute v. Donovan, 452 U.S. 490 ("Cotton Dust"), and by every federal court of appeals that has since addressed a challenge to a newly-promulgated OSHA standard.^{3/} Federal courts of appeals have also followed the Benzene decision for the proposition that an employer whose practices do not pose a

^{3/}See, e.g., AFL-CIO v. OSHA, 65 F.2d 962, 972-73 (11th Cir. 1992) (air contaminants); American Dental Association v. Martin, 984 F.2d 823, 827, 832 (7th Cir. 1992) (bloodborne pathogens); International Union, UAW v. OSHA, 938 F.2d 1310, 1316 (D.C. Cir. 1991) (lockout/tagout); National Grain and Feed Association, Inc. v. OSHA, 866 F.2d 717, 737 (5th Cir. 1989) (grain handling); International Union UAW v. Pendergrass, 878 F.2d 389, 392 (D.C. Cir. 1989) (formaldehyde); Building & Construction Trades Dept., AFL-CIO v. Brock, 838 F.2d 1258, 1263 (D.C. Cir. 1988) (asbestos); Associated Builders and Contractors, Inc. v. Brock, 862 F.2d 63, 67 (3rd Cir. 1988) (hazard communication); Public Citizen Health Research Group v. Tyson, 796 F.2d 1479, 1496 (D.C. Cir. 1986) (ethylene oxide); Forging Industry Association v. Sec. of Labor, 773 F.2d 1436 (4th Cir. 1985) (noise); ASARCO, Inc. v. OSHA, 746 F.2d 483, 490 (9th Cir. 1984) (arsenic); United Steelworkers of America, etc. v. Marshall, 647 F.2d 1189, 1245 (D.C. Cir. 1980) (lead); Texas Indep. Ginners' Ass'n v. Marshall, 630 F.2d 398, 407 (5th Cir. 1980) (cotton ginning). See also National Cottonseed Products Association v. Brock, 825 F.2d 482, 484 (D.C. Cir. 1987) (medical surveillance of cotton dust exposure); Public Citizen Health Research Group, et al. v. Auchter, 702 F.2d 1150, 1156 (D.C. Cir. 1983) (emergency temporary standard on ethylene oxide); Louisiana Chemical Association v. Bingham, 657 F.2d 777, 782 (5th Cir. 1981) (access to exposure and medical records).

significant risk of material health impairment cannot be held in violation of an OSHA safety and health standard. (See, for example, Pratt & Whitney Aircraft, et al. v. Secretary of Labor, 715 F.2d 57 (2d Cir. 1983)) Nine (9) different federal courts of appeals follow the significant risk test articulated by the plurality in the Benzene decision.^{4/}

In Benzene, the Supreme Court prohibited OSHA from applying its then-standard policy on carcinogens to regulate benzene. The OSHA policy stated that "in the absence of definitive proof of a safe level [of a substance to which employees are exposed], it must be assumed that any level above zero presents some increased risk of cancer." (448 U.S. at 635-36) Pursuant to this policy, OSHA contended that it was justified in regulating carcinogens to the lowest feasible level, which, in some cases, meant a total prohibition of the substance at issue. The Supreme Court disagreed, holding that OSHA could not rely on the unsupported assumption that any level above zero of a given substance would pose a significant risk. (448 U.S. at 653) According to the Court, before OSHA could ban a substance

^{4/}See, e.g., Donovan v. General Motors Corp., 764 F.2d 32, 36 (1st Cir. 1985); Pratt and Whitney Aircraft v. Donovan, 715 F.2d 57, 61-62 (2d Cir. 1983); Pratt and Whitney Aircraft v. Secretary of Labor, 649 F.2d 96, 103-104 (2d Cir. 1981). See Kelly Springfield Tire Co., Inc. v. Donovan, 79 F.2d 317, 323 (5th Cir. 1984); Modern Drop Forge Co. v. Secretary of Labor, 683 F.2d 1105, 1115 (7th Cir. 1982). Super Excavators v. Occupational Safety and Health Review Commission, 674 F.2d 592, 595 (7th Cir. 1981). Two of these cases were decided by circuits that had not yet addressed a challenge to a newly-promulgated standard.

completely from the workplace, it had to demonstrate that eliminating "any level" of the substance, "no matter how minute the exposure," was necessary to yield a significant "discernable benefit." (448 U.S. at 645)

In direct contravention of the U.S. Supreme Court's ruling in Benzene, OSHA now proposes to ban environmental tobacco smoke (ETS) completely from all areas of an enclosed workplace where employees perform work. The Agency proposes this drastic course even though it admittedly lacks any data to suggest that the elimination of "any level" of ETS, "no matter how minute the exposure," is necessary to yield a significant "discernible benefit." Exactly like OSHA's attempted regulation of benzene over a decade ago, the Agency is now relying on the unsupported assumption that any level of ETS above zero poses an increased risk of material health impairment in order to justify a regulation that will, in effect, reduce exposure for nonsmoking employees to zero.

II. OSHA HAS NOT COMPLIED WITH THE TWO-PRONGED
SIGNIFICANT RISK TEST ARTICULATED IN BENZENE

A. OSHA's assessment of the risk allegedly posed by existing
workplace levels of ETS is fatally flawed

As the Supreme Court explained in Benzene, while OSHA has "no duty to calculate the exact probability of harm, it does have an obligation to find that a significant risk is present before it can characterize a place of employment as 'unsafe.'" (448 U.S. at 655) In AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir. 1992) (Air Contaminants), the Eleventh Circuit discussed the quantification of risk, explaining that "OSHA must provide at least an estimate of the actual [workplace] risk associated with a particular toxic substance." The Court found that "OSHA has satisfied this requirement by estimating either the number of workers likely to suffer the effects of exposure or the percentage of risk to any particular worker." (965 F.2d at 973)

In Benzene, the Supreme Court set forth the quantitative parameters within which a significant risk lies. The Court stated: "If, for example, . . . the odds are one in a thousand that regular inhalation of gasoline vapors that are 2% benzene will be fatal, a reasonable person might well consider the risk significant and take appropriate steps to decrease or eliminate it." (448 U.S. at 655) [emphasis added]

Following this example, OSHA has embraced the 1 in 1,000 test as a policy guideline, consistently promulgating occupational safety and health standards where it estimates the level of risk from existing workplace exposure to be one excess death per 1,000 employees.^{5/} This means that compared to the risk faced by the general population from exposure away from the workplace, an additional one person out of every one thousand will suffer material health impairment because of exposure at work. Additionally, the federal courts have recognized this policy as OSHA's regulatory guideline. (See, AFL-CIO v. OSHA, 965 F.2d. 962, 973 n. 15 (11th Cir. 1992); International Union, UAW v. Pendergrass, 878 F.2d 389, 392 (D.C. Cir. 1989).)

OSHA has estimated the risk of lung cancer and heart disease allegedly posed by workplace exposure to ETS. According to OSHA's estimate, the lifetime occupational risk of lung cancer in nonsmoking employees from exposure to ETS at the workplace is 0.4 to 1 case per 1,000 exposed employees. OSHA estimates that the lifetime occupational risk of heart disease in nonsmoking employees

^{5/}See, e.g., 57 FR 42102, 42206 (Occupational Exposure to Cadmium); 56 FR 64004, 64037 (Bloodborne Pathogens); 55 FR 32736, 32786 (Occupational Exposure to Butadiene); 54 FR 9294, 9312 (Hazardous Waste Operations and Emergency Response); 54 FR 2332, 2675 (Occupational Exposure to Air Contaminants - Acrylamide); Id. at 2678 (Amitrole); Id. at 2680 (Carbon Tetrachloride); Id. at 2682 (Chloroform); Id. at 2691 (P-Toluidine); Id. at 2694 (Vinyl Bromide); 52 FR 34460, 34507 (Occupational Exposure to Benzene); 51 FR 22612, 22646-7 (Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite); 49 FR 25734, 25764 (Occupational Exposure to Ethylene Oxide); 48 FR 1864 (Occupational Exposure to Inorganic Arsenic).

from workplace exposure to ETS is 7 to 16 cases per 1,000 exposed employees.

In developing these risk estimates, OSHA uncritically relies upon one epidemiologic study to determine the alleged risk of lung cancer due to ETS exposure in the workplace, without adequate discussion of the study's quality or weaknesses. (59 FR 15995) The workplace data from 13 other available studies on nonsmoker lung cancer, eight of which were conducted in the U.S., were ignored. OSHA also utilizes a single epidemiologic study on cardiovascular disease (CVD) that addresses spousal smoking in the home to estimate the risk allegedly due to ETS exposure in the workplace, while ignoring available data on reported ETS exposures and CVD in the workplace. (59 FR 15995)

In these two epidemiologic studies on which OSHA's risk estimates are based, ETS exposures were not measured directly. Instead, ETS exposures were estimated in the two studies by individual recollection of exposure. Accurate quantification of exposure cannot be ascertained through this kind of study. No measured ambient exposure data for ETS are included in OSHA's estimate of the risk allegedly posed by ETS in the workplace. Thus, OSHA offers an analysis of risk and a proposal for the complete elimination of ETS from indoor work areas without reference to any measured exposure data.

Despite OSHA's failure to consider such studies, measured exposure data for constituents of ETS in the air of indoor work environments are currently available. Indeed, OSHA's NPR does not reference a single ambient air monitoring study for the workplace published after 1991, the same year in which OSHA admitted that it had no adequate data on "current levels of exposure" for ETS. (59 FR 15990)

Although the studies were available, the OSHA NPR nevertheless states that "estimating the risk from exposure to ETS requires the use of some measure of the extent of exposure." (59 FR 15997) OSHA acknowledges failure to integrate measured ambient ETS exposure data into its analysis of significant risk and states that "[s]ince there is no definition of, nor an established method for quantifying, exposure, it is not possible to determine a 'dose limit' that would eliminate significant risk." (59 FR 16001) As discussed below, and demonstrated in the scientific portion of Philip Morris' comments, current exposure data on ETS levels in the workplace do not support the conclusion that ETS poses a significant risk of material health impairment to nonsmoking employees.

There are well over 100 published studies on ETS measurements in the air of public places, workplaces, restaurants and other locations, all of which were submitted by Philip Morris to OSHA in response to the 1991 Request for Information on

Occupational Exposure to Indoor Air Pollutants ("RFI"). (Ex. 3-1074) These studies report measurements for constituents of ETS in the air. The most commonly measured constituents are carbon monoxide, nicotine, and respirable suspended particles (RSP). The data from these numerous studies suggest that, overall, nonsmoker exposure to ETS under normal everyday conditions is actually very low.

For example, researchers report that there is very little difference in ambient levels of carbon monoxide in smoking and nonsmoking areas of workplaces and public places, and in homes with and without smokers.^{5/} Other studies indicate that ETS contributes 10 to 50 percent of the total particles in the air of a typical public place in which smoking is permitted.^{7/} Recent workplace air

^{5/}See Kirk, P., et al., "Environmental Tobacco Smoke in Indoor Air," in: Indoor and Ambient Air Quality. R. Perry and P. Kirk (Eds.). London, Selper Ltd., 99-112, 1988; Duncan, D. and Greavey, P., "Passive Smoking and Uptake of Carbon Monoxide in Flight Attendants" JAMA 251(20): 120-21, 1984; Cox, B. and Whichelow, M., "Carbon Monoxide Levels in the Breath of Smokers and Nonsmokers: Effect of Domestic Heating Systems," J Epidemiol Community Health 39: 75-78, 1985; Girman, J. and Traynor, G., "Indoor Concentrations," JAPCA 33(2): 89, 1983; Yocom, J., "Indoor Concentrations," JAPCA 33(2): 89, 1983; and Nitta, H., et al., "Measurements of Indoor Carbon Monoxide Levels Using Passive Samplers in Korea" in: Indoor Air '90. The Fifth International Conference on Indoor Air Quality and Climate, Toronto, Canada, July 29-August 3, 77-82, 1990. Philip Morris submitted these studies to OSHA on March 18, 1992, in response to OSHA's RFI (Ex. 3-1074).

^{7/}See Baker, R. and Proctor, C., "The Origins and Properties of Environmental Tobacco Smoke," Env. Int. (16): 231-245, 1990; Guerin, M., et al., The Chemistry of Environmental Tobacco Smoke: Composition and Measurement, (Lewis Publishers: Chelsea, Michigan, 1992); Reasor, M. and Will, J., "Assessing Exposure to Environmental Tobacco Smoke: Is It Valid to Extrapolate from
(continued...)"

monitoring studies report that levels of respirable suspended particles (RSP) range from about 5.8 to 45.9 ug/m³, averaging only 21.3 ug/m³. (See Table 5 attached at Part IV.)

2/ (...continued)

Active Smoke?" Journal of Smoking Related Diseases 2(1): 111-127, 1991; Proctor, C. and Dymond, H., "The Measurement of ETS Through Absorption/Desorption Procedures" in: Indoor Air Quality. H. Kasuga (ed.). Springer-Verlag, Berlin, Heidelberg, 82-89, 1990; Nystrom, C., et al., "Assessing the Impact of Environmental Tobacco Smoke on Indoor Air Quality: Current Status" in: Proceedings of the ASHRAE Conference, IAQ '86. April 20-23, 1986, Atlanta, Georgia, 213-233, 1986; Rawbone, R., "The Aging of Sidestream Tobacco Smoke Components in Ambient Environments" in: Indoor Air Quality. H. Kasuga (ed.). Springer-Verlag, Berlin, Heidelberg, 55-61, 1990; Piade, J., et al., "Assessment of ETS Impact on Office Air Quality" in: Indoor Air Quality. H. Kasuga (ed.). Springer-Verlag, Berlin, Heidelberg, 112-119, 1990; Scherer, G., et al., "Importance of Exposure to Gaseous and Particulate Phase Components of Tobacco Smoke in Active and Passive Smokers," Occup Env Health (62): 459-466, 1990; Rodgman, A., "Environmental Tobacco Smoke," Reg Tox and Pharm 16:223-244, 1992; Kirk, P., et al., "Environmental Tobacco Smoke in Indoor Air" in: Indoor and Ambient Air Quality. R. Perry and P. Kirk (Eds.). London, Selper Ltd., 99-112, 1988; Carson, J. and Erikson, C., "Results from a Survey of Environmental Tobacco Smoke in Offices in Ottawa, Ontario," Environ Technol Letters 9: 501-508, 1988; Sterling, T., et al., "Environmental Tobacco Smoke and Indoor Air Quality in Modern Office Work Environments," Journal of Occupational Medicine 26(1): 57-62, 1987; Sterling T. and Mueller, B., "Concentrations of Nicotine, RSP, CO and CO₂ in Nonsmoking Areas of Offices Ventilated by Air Recirculated From Smoking Designated Areas," Am Ind Hyg Assoc J 49(9): 423-426, 1988; Holcomb, L., "Indoor Air Quality and Environmental Tobacco Smoke: Concentration and Exposure," Environment Int (19):9-40, 1993; Oldaker, G., et al., "Results From Surveys of Environmental Tobacco Smoke in Restaurants" in: Indoor Air Quality. H. Kasuga (Ed.). Springer-Verlag, Berlin, Heidelberg, 99-104, 1990; Turner, S., "The Measurement of Environmental Tobacco Smoke in 585 Office Environments," Environment Int (18): 19-28, 1992; Proctor, C., et al., "Measurements of Environmental Tobacco Smoke in an Air-Conditioned Office Building," Environ Technol Letters (10): 1003- 1018, 1989; and Proctor, C., et al., "Measurements of Environmental Tobacco Smoke in an Air-Conditioned Office Building" in: Present and Future of Indoor Air Quality. C. J. Bieva, et al. (eds.). Brussels, Elsevier, 169-172, 1989. Philip Morris submitted these studies to OSHA on March 18, 1992, in response to OSHA's RFI (Ex. 3-1074).

Also, recent workplace air monitoring studies report that actual measured nicotine levels range from about 0.17 to 7.2 ug/m³, averaging 2.8 ug/m³. (See Table 5 attached at Part IV.) In terms of cigarette equivalents, typical measurements of nicotine range from an exposure equivalent of 1/100 to less than 1/1,000 of one filter cigarette per hour. This means that a nonsmoker would have to spend from 100 to 1,000 hours or more in an office, restaurant or public place where smoking is unrestricted, in order to be exposed to the nicotine equivalent of a single cigarette.^{8/}

^{8/}See, Carson, J. and Erikson, C., "Results from a Survey of Environmental Tobacco Smoke in Offices in Ottawa, Ontario," Environ Technol Letters 9: 501-508, 1988; Oldaker, G., et al., "Results From Surveys of Environmental Tobacco Smoke in Offices and Restaurants" in: Indoor Air Quality. H. Kasuga (Ed.). Springer-Verlag, Berlin, Heidelberg, 99-104, 1990; Hinds, W. and First, M., "Concentrations of Nicotine and Tobacco Smoke in Public Places," New England Journal of Medicine 292(16): 844-845, 1975; Badre, R., et al., "Pollution Atmospherique par la Fumee de Tabac (Atmospheric Pollution by Smoking)," Ann Pharm Fr 36(9-10): 443-452, 1978. Translation; Jenkins, R., et al., "Development and Application of a Thermal Desorption-Based Method for the Determination of Nicotine in Indoor Environments" in: Indoor and Ambient Air Quality. R. Perry and P. Kirk (eds.). London, Selper Ltd., 557-566, 1988; Muramatsu, J., et al., "Estimation of Personal Exposure to Tobacco Smoke with a Newly Developed Nicotine Personal Monitor," Environ Res 35: 218-227, 1984; Muramatsu, J., et al., "Estimation of Personal Exposure to Ambient Nicotine in Daily Environment," Arch Occup Environ Health 59: 545-550, 1987; Thompson, C., et al., "A Thermal Desorption Method for the Determination of Nicotine in Indoor Environments," Envir Sci Tech 23: 429-435, 1989; Folliart, D., et al., "Passive Absorption of Nicotine in Airline Flight Attendants," New England Journal of Medicine 308(18): 1105, 1983; and Oldaker, G., and Conrad, F., "Estimation of the Effect of Environmental Tobacco Smoke on Air Quality Within Passenger Cabins of Commercial Aircraft," Envir Sci Tech 21: 994-999, 1987. Philip Morris submitted these studies to OSHA on March 18, 1992, in response to OSHA's RFI (Ex. 3-1074).

These data on minimal workplace exposure were confirmed recently by Mr. Simon Turner of Healthy Buildings International, who testified before the Maryland Occupational Safety and Health Advisory Board on December 16, 1993, regarding that state's proposed workplace smoking regulation. (Transcript, Vol. II, page 159, lines 6-10) He testified that, according to the published studies, "the [ETS] levels that are actually out there are between 14 and 23 times lower than the ones that are claimed by Mr. [James] Repace [of the U.S. Environmental Protection Agency]."^{2/} (Id. at page 160, lines 1-3.)

Additional data on workplace exposure were submitted to the Maryland Division of Labor and Industry at a May 3, 1994, public hearing on the same proposed regulation about which Mr. Turner testified. Dr. Domingo M. Aviado, a scientist, medical doctor, and preeminent expert in occupational toxicology and tobacco smoke constituents, testified that "levels of purported ETS constituents are unlikely even to approach workplace standards," such as the OSHA "permissible exposure limits" (PELs) and the sometimes significantly lower "threshold limit values" (TLVs) recommended by the American Conference of Governmental Industrial

^{2/}Mr. Repace's studies and models of the levels of certain ETS constituents in selected workplaces were relied upon by OSHA in the NPR. Mr. Repace also contributed to EPA's recent risk assessment on the alleged health effects of ETS exposure in the home (discussed below).

Hygienists.^{10/} (Transcript, Vol. VI, page 116, lines 13-15) Dr. Aviado concluded: "There is insufficient biomedical basis to support the general proposition that ETS exposure causes occupational diseases." (Id. at page 124, lines 9-11) An accurate assessment by OSHA of the risk, if any, posed by existing unregulated levels of ETS in the workplace must thus conclude that any such actual exposure does not pose a significant risk of

^{10/}Dr. Aviado has practiced, taught, and researched in the field of occupational toxicology and medical pharmacology for over 45 years. On obtaining his medical degree in 1948 from the University of Pennsylvania, he began research and teaching at that university in medical pharmacology, progressing from instructor to professor of pharmacology from 1948 to 1977. (Transcript, Vol. VI, page 112, lines 12-17) At the University of Pennsylvania Medical School, Dr. Aviado's sponsored research was funded by the Department of Defense, Food and Drug Administration, Consumer Products Safety Commission, National Institutes of Health, Council for Tobacco Research, and the pharmaceutical industry. (Id. at page 112, lines 18-21; page 113, lines 1-5) In 1978, Dr. Aviado was appointed to the Environmental Protection Agency's Scientific Advisory Board (EPA-SAB) and was the physician member of the Clean Air Scientific Advisory Committee, mandated by the 1977 Clean Air Act. (Id. at page 115, lines 20-21; page 116, lines 1-3) Since 1978, he has been President of Atmospheric Health Sciences, which provides consulting services in the fields of pharmacological sciences, occupational toxicology and medicine. (Id. at page 113, lines 10-14)

Approximately half of Dr. Aviado's research activity has related to the alleged health effects of chemical constituents of tobacco smoke. He has published 300 articles, 10 monographs, one textbook of pharmacology and two medical dictionaries. (Id. at page 113, lines 14-18) Significantly, Dr. Aviado has recently authored a chapter entitled "Complex Mixtures of Tobacco Smoke and the Occupational Environment" in the 1993/94 edition of Patty's Industrial Hygiene & Toxicology. (Id. at page 114, lines 5-8) This chapter, along with Dr. Aviado's other chapter on fluorocarbons, was thoroughly reviewed both by the editors and several outside reviewers. (Id. at page 115, lines 6-8) For the past four decades, Patty's has been widely recognized as the authoritative reference on industrial hygiene and toxicology. (Id. at page 115, lines 8-11)

material health impairment. (See Building and Construction Trades Dept., AFL-CIO v. Brock, 838 F.2d 1258, 1266 (D.C. Cir. 1988))

At the same May 3, 1994, Maryland hearing, Dr. Roger Jenkins of Oak Ridge National Laboratory (ORNL) testified about his laboratory's ongoing study examining actual ETS exposures in the workplace. The ORNL study, described as "the largest ever conducted in the United States of the personal exposure of individuals to environmental tobacco smoke in the home and workplace," involves 1,600 randomly-selected employees in 16 U.S. cities who each wear a personal ETS exposure monitor at work, and a separate monitor while away from work. (Transcript, Vol. VI, page 87, lines 6-16) The two monitors measure the various ETS constituents to which the employee is exposed throughout a 24-hour period, eight hours at work and 16 hours away from work.^{11/} (Id. at page 89, lines 8-13; page 104, lines 5-21; page 105, lines 1-11.) When questioned about the preliminary results of the ORNL study, Dr. Jenkins responded that data from the six cities where the study has been completed show that exposure to ETS constituents away from work is generally three to four times greater than

^{11/}The study measures actual exposure to the following ETS constituents: respirable suspended particulate (RSP) matter, UV absorbing particulate matter, fluorescing particulate matter, solanesol (a tobacco-specific terpene), nicotine, 3-ethenyl pyridine, and myosmine. (Transcript, Vol. VI, page 88, lines 6-12)

exposure at work.^{12/} (Id. at page 93, lines 6-14.) Moreover, since exposure away from work is twice as long as exposure at work, total exposure away from work could be as much as six to eight times greater than workplace exposure. (Id. at page 93, lines 14-16.) According to Dr. Jenkins, if these trends hold for the rest of the 16 cities, then the ORNL data will support the position that ETS exposure away from work is "several factors greater" than workplace exposure. (Id. at page 92, lines 7-12.)

Dr. Jenkins pointed out that the preliminary results of the ORNL study are consistent with the results of a similar study conducted by Hazelton Laboratories in the United Kingdom. (Id. at page 91, lines 10-13.) Like the ORNL study, the Hazelton study involved the acquisition of 24-hour personal exposure samples for approximately 250 participants. (Id. at page 91, lines 13-16.) The Hazelton study reported that "workplace exposures to nicotine were about half those that occur in the home." (Id. at page 91, lines 19-20.)

The preliminary data from the ORNL study and the data from the Hazelton study are critical because they directly conflict with the recent EPA risk assessment on the alleged health effects of ETS (the "EPA Report," Ex. 8-311), which contended, without

^{12/}The "at work" environment is comprised of workplaces where there are "essentially no restrictions as to smoking." (Transcript, Vol. VI, page 95, line 21; page 96, lines 1-3; page 102, lines 6-8; page 102, lines 20-21; page 103, lines 1-4)

support, that workplace concentrations of ETS are "analogous" to concentrations to which spouses of smokers are exposed at home.^{13/} (Id., at page 91, line 21; page 92, lines 1-4.) But given this un rebutted evidence of actual workplace exposure at existing levels, any reliance by OSHA on the EPA Report focusing on spousal exposure in the home to justify a workplace smoking regulation is unfounded.

As recently as March of this year, OSHA itself stated:

Under the OSH Act, OSHA must make its own determinations of significant risk and feasibility and cannot, as ASH suggests, simply rely upon EPA's or any other agency's assessment of the evidence. That there is consensus among governmental agencies and scientific organizations concerning ETS's carcinogenicity does not obviate the need for OSHA to determine that occupational ETS exposure constitutes a significant risk. During the early stages of OSHA's consideration of this issue, it had to determine how to relate available assessments of risk to occupational settings.

ASH v. OSHA, No. 92-1661, Brief for the Secretary of Labor, Petition to Review a Final Decision of the Occupational Safety and Health Administration, page 32, n. 24 (D.C. Cir., March 1994)
[emphasis added]

^{13/}The EPA risk assessment, titled "Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders," focuses almost exclusively on reported exposures to ETS from spousal smoking in the home, not workplace exposure.

In 1991, at oral argument in a related case, the OSHA representative stated:

The principal risk assessments in this area are not definitive, because they rely heavily upon data developed in residential studies, rather than on actual occupational exposures. OSHA has noted that the conditions affecting occupational exposure vary widely, depending upon building size and type, ventilatory exchange rates, occupational density and other factors.

ASH v. OSHA, No. 89-1656, Transcript of Proceedings, page 12, lines 13-19, (D.C. Cir., May 6, 1991) [emphasis added] The OSHA representative then pointed out that

the Surgeon General's report, on which ASH places heavy reliance, is typical of this group of studies, in that it expressly recognizes that the degree of risk due to exposure to ambient tobacco smoke is uncertain, and that additional and more accurate estimates [of] exposures in the workplace, in the home and in public places is necessary in this arena.

Id. at page 16, lines 10-16 [emphasis added]

In addition to its failure to consider all the workplace data, OSHA failed to consider the effects of the indoor air quality provisions of the proposed standard on its ETS risk assessment. For example, as discussed in detail below, improving the operation of a building's ventilation system will dilute ETS constituents significantly.

1. The best available evidence related to existing levels of workplace ETS does not support a significant risk of material health impairment

Section 6(b)(5) of the OSH Act requires any standard promulgated by OSHA to be based, to the extent feasible, on the "best available evidence." In Benzene, the Supreme Court pointed out that the Fifth Circuit below had held that OSHA's ban on dermal contact with benzene was not based on the "best available evidence." The Supreme Court stated:

In light of §6(b)(5), which requires the Agency to promulgate standards on the basis of the 'best available evidence' and the 'latest available scientific data in the field,' the court held that where there is uncontradicted testimony that a simple test will resolve the issue, the Agency is required to acquire that information before 'promulgating regulations which would require an established industry to change long-followed work processes that are not demonstrably unsafe.' (581 F.2d, at 508)

(448 U.S. at 661)

The Supreme Court did not reach the Fifth Circuit's holding, finding that OSHA failed to make the required threshold finding that the dermal contact ban is "reasonably necessary or appropriate" to remove a significant risk of harm from such contact. (Id. at 662.)

Similarly, in Texas Independent Ginners Association v. Marshall, 630 F.2d, 398 (5th Cir. 1980), petitioners sought review

of an OSHA standard on cotton dust exposure in the cotton gin industry. In promulgating the standard, OSHA relied exclusively on studies demonstrating that exposure to cotton dust in the American textile industry and in foreign ginning operations caused byssinosis. Petitioners alleged that these studies were not the best available evidence, since a study which actually analyzed exposure to cotton dust in the American cotton gin industry was available. That study found no evidence of byssinosis or other chronic respiratory disease among American gin workers. The Fifth Circuit vacated the standard, holding in part that OSHA failed to base the regulation on the "best available evidence," as required by the OSH Act. The Court stated: "on further consideration, OSHA's continued refusal to consider this latest available scientific test would violate its statutory obligation to consider the best available evidence." (Id. at 413, fn. 48.)

a. Workplace exposure levels

Philip Morris submits that both the Hazelton study and the ORNL study discussed above are among the best data available on actual workplace exposures to ETS.^{14/} Moreover, although many studies have monitored ETS constituent levels in certain areas of various workplaces, the ORNL and Hazelton studies actually measured

^{14/}Dr. Jenkins himself testified: "I might note that several of the speakers today have indicated the need to make assumptions concerning the relevant magnitude of home or workplace exposures, our study will provide hard data on that." (Transcript, Vol.VI, page 90, lines 9-13) [emphasis added]

ETS constituent levels in the breathing zones of individual employees. This latter measurement can only be obtained from personal air monitors worn by employees while they are at work. Philip Morris submits that the measurement of ETS constituent levels in the breathing zone of individual employees is the best method of accurately assessing actual workplace exposure. Most of the other studies, including the one by Mr. Repace cited at 59 FR 15991 (Table III-10), are based upon area monitoring, rather than personal monitoring of the employee's breathing zone. Moreover, Mr. Repace's study relies in significant part upon extrapolations, assumptions and modeling to try to predict the possible level of ETS constituents to which employees might be exposed in the workplace.

The "best available evidence" on ETS workplace exposure is the measurement of actual exposure obtained from personal monitoring in the breathing zone of employees at work. A "model," based upon assumptions, is on its face significantly less reliable. Moreover, studies based upon individual recollection of exposure, such as the two relied upon by OSHA to estimate risk in this rulemaking, are even less reliable than the available models. OSHA's estimate of the risk, if any, from exposure to existing levels of ETS in the workplace is thus not based upon the "best available evidence," as required by § 6(b)(5) of the OSHA Act.

b. Alleged health effects

Eleven of the 30 spousal smoking studies analyzed in the EPA Report included estimates of workplace ETS exposures in addition to exposure in the home environment. Fifteen separate risk estimates were presented in those studies. Thirteen of those 15 risk estimates were not statistically significant, thus not supporting the claim that an increased risk of lung cancer is associated with workplace ETS exposure. Moreover, if workplace data from these 11 studies were pooled in a meta-analysis, similar to the one conducted by the EPA on spousal smoking, the risk estimate would approximate 1.00, supporting no association between reported workplace exposures to ETS and lung cancer in non-smokers.^{15/}

One of the most recent studies on the alleged association between workplace ETS exposure and lung cancer is the Brownson, et al. study, published in 1992.^{16/} Although EPA was preparing its report on ETS, including a meta-analysis of the spousal smoking studies at that time, it ignored data from the Brownson study. Brownson and colleagues reported on results of a case-control study

^{15/}LeVois, M.E. and Layard, M.W., "Inconsistency Between Workplace and Spousal Studies of Environmental Tobacco Smoke and Lung Cancer," Regulatory Toxicology and Pharmacology 19: 309-316, 1994. Attached at Section V of this comment.

^{16/}Brownson, R.C., Alavanja, M.C.R., Hock, E.T., and Loy, T.S., "Passive Smoking and Lung Cancer in Nonsmoking Women," American Journal of Public Health 82: 1525-1530, 1992. Attached at Section V of this comment.

of Missouri women who were lifetime nonsmokers or former smokers. The study is notable for its large sample size, since over 600 lung cancer cases were enrolled, more than 400 of whom were self-reported lifetime nonsmokers. The authors wrote: "In general, there was no elevated lung cancer risk associated with passive smoke exposure in the workplace." The authors of the study presented a risk estimate for the highest category of workplace exposure that did not reach statistical significance; they failed to present an overall workplace risk estimate.

Moreover, the extremely weak linkage between spousal smoking and chronic disease in nonsmokers has been acknowledged by Dr. Morton Lippmann, Chairman of the Science Advisory Board Committee that reviewed EPA's risk assessment on ETS. Speaking to reporters in April 1991, Dr. Lippmann stated that the risk attributed to ETS was "probably much less than you took to get here through Washington traffic" to attend the news conference held to discuss the Committee's recommendations on the first draft of the risk assessment.^{17/}

More recently, on May 11, 1994, the authors of a recent Congressional Research Service (CRS) Report for Congress on the use of cigarette taxes to fund health care reform testified before the United States Senate Subcommittee on Clean Air and Nuclear

^{17/}See R.A. Taylor, "EPA Panel Reports Non-Smokers at Risk," The Washington Times, April 19, 1991, page A3 (Attached).

Regulation about the statistical basis for estimating the alleged health effects of passive smoking, particularly the EPA report.^{18/} The authors concluded, "[O]ur evaluation was that the statistical evidence does not appear to support a conclusion that there are substantial health effects of passive smoking. This finding flows from an analysis of the statistical methodology employed in assessing such health effects." (page 13)

2. OSHA has failed to establish significant risk of material impairment from existing occupational exposure to ETS because, by OSHA's own account, the risk allegedly faced by exposed workers is indistinguishable from the purported risks faced by the general population

As noted above, OSHA's burden, as a threshold matter, is to show by substantial evidence that at existing levels of exposure in the workplace, a substance poses a significant risk of harm. In the case of ETS, however, OSHA has an additional task because the Agency contends "that exposure to ETS is common" (59 FR 15980) and that for the ETS constituent nicotine, "the range of average nicotine concentrations in office workplaces is very similar to that of homes." (59 FR 15994)

Where a substance is allegedly ubiquitous and exposure to that substance in the workplace is "indistinguishable" from exposure in the general population, as OSHA contends is the case

^{18/}A copy of the March 8, 1994 CRS Report, entitled "Cigarette Taxes to Fund Health Care Reform: An Economic Analysis," and the May 11, 1994 testimonial record are attached collectively.

with ETS, then the agency must determine the significance of regulating only workplace exposures to ETS before it can justify that such a regulation is "reasonably necessary or appropriate," as required by Benzene. The Agency must quantify the significance of the workplace exposure in terms of excess risk, if any, above and beyond that experienced by the general population, resulting from that exposure.

In OSHA's Hazard Communication Standard, 29 C.F.R. § 1910.1200, for example, OSHA properly chose not to regulate exposure to toxic substances in the workplace where exposure to these substances in the workplace was identical to exposures in non-occupational settings. Thus, the Hazard Communication provisions addressing "scope and application" provide, in pertinent part:

(6) This section does not apply to:

...(vii) Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can demonstrate it is used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers;...

(1910.1200(b)(6)(vii)) Clearly, OSHA was acknowledging, in the context of the Hazard Communication Standard, that where exposures to "toxic" materials in the workplace are identical to exposures in

non-occupational settings, there is no need to regulate the workplace exposures.

The most recent example of an OSHA regulation which addressed potentially "ubiquitous" exposures that occur in both occupational and non-occupational settings arose in the case of the Bloodborne Pathogen Standard. There, OSHA analyzed significant risk in the workplace by stating:

Clearly it is possible for workers with exposure to blood to become infected with the HBV [hepatitis B virus] by means other than occupational exposure. The virus can be transmitted sexually and by non-occupational exposure to blood. In addition, over fifty percent of the cases of HBV reported to the Centers for Disease Control in 1985 had no known risk factors (Ex. 6-217).

Several commentators viewed OSHA's estimates as being over-estimates of the true risk by stating that OSHA did not appropriately consider the fact that most healthcare workers who are infected with hepatitis B probably contracted their infection due to factors outside the workplace (Ex. 20-2879C). In fact, OSHA took measures to exclude the effect of high risk behaviors in healthcare workers by estimating the risk attributable to occupational exposure. The risk attributable to occupational exposure is the difference between the risk faced by exposed workers and the background risk faced by the general population. In order to remove that portion of HBV cases in healthcare workers that might be due to IV drug use or other known risk factors, the Agency subtracted from the healthcare worker risk the background (population) risk of HBV infection. [emphasis added]

(56 FR 64027)

If the foregoing test for differentiating "ubiquitous" risk is applied in this case, the result, according to OSHA's NPR,

would be zero risk attributable to occupational exposure to ETS. OSHA has asserted that "risk estimates based on residential exposures are expected to accurately reflect occupational risks in most workplaces and possibly underestimate the risk in some workplaces." (59 FR 15994) [emphasis added] However, as discussed elsewhere in this submission, recent studies report actual exposure levels in the workplace that are, in fact, much lower than exposure levels in the home. Nevertheless, even assuming for the sake of argument that home and workplace exposures are comparable, OSHA has failed to subtract non-occupational exposure from its risk estimate as was done in the Bloodborne Pathogens Standard. (29 CFR 1910.1030) In addition, OSHA made no attempt to quantify or substantiate this assumption for "some workplaces," so as to demonstrate the increased risk, if any, attributable to occupational exposure in those unique workplaces.

The Benzene Court also acknowledged the need to compare workplace risk with "every day" risk experienced by the general population in order to determine whether such workplace risk is "significant." That Court explained as follows:

'[S]afe' is not the equivalent of 'risk-free.' There are many activities that we engage in every day--such as driving a car or even breathing city air--that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities 'unsafe.' Similarly, a workplace can hardly be considered 'unsafe' unless it threatens the workers with a significant risk of harm. [emphasis added]

(448 U.S. at 642)

The Benzene Court recognized that certain activities which entail risks are nonetheless deemed insignificant because of the "every day" nature of these activities. Although driving a car, as cited by the Court, entails a lifetime accident risk of 20 in 1,000,^{19/} the court deemed it insignificant due to the fact that it is an "every day" activity. OSHA has already admitted that, as with driving a car or breathing city air, "exposure to ETS is common" (59 FR 15980) and that for the biomarker nicotine, "the range of average nicotine concentrations in office workplaces is very similar to that of homes." (59 FR 15994) Therefore, exposure to ETS is an every day activity which allegedly entails a risk. One crucial difference, however, between the every day activities of driving a car and being exposed to ETS is that driving a car entails an accident risk of 20 in 1,000. With respect to ETS, however, OSHA has not shown and indeed cannot show that occupational exposure entails a risk of material health impairment.

Since the OSH Act limits OSHA to "reasonably necessary and appropriate" regulations, the Agency is constrained by its enabling legislation, as interpreted by the Courts and the Agency, to address those risks in the workplace that are significantly greater than the risks existing in the general population. Until existing workplace exposure to ETS is shown to be significantly greater than exposure in the general population, OSHA cannot

^{19/}Hallenbeck, W.H. and Cunningham, K.M., Quantitative Risk Assessment for Environmental and Occupational Health, Lewis Publishers (1986) page 3.

demonstrate that regulation of ETS in the workplace would be "reasonably necessary or appropriate."

B. The proposed standard's workplace smoking restrictions are not reasonably necessary to significantly reduce a significant risk

1. OSHA has not demonstrated that reducing the current OSHA permissible exposure limits for the constituents of ETS is necessary to reduce a significant risk

OSHA has failed to acknowledge that several of the constituents of ETS are already regulated by the Agency.^{20/} OSHA currently regulates exposure to more than half of the constituents imputed to ETS, listed in OSHA's NPR (Tables III-6 and III-7). In previous rulemakings which addressed exposure to substances already covered by OSHA standards, the agency has consistently stated that prior to reducing the permissible exposure limit for this substance, it must first determine whether there is a significant health risk at the current exposure limit under the existing standards which would justify lowering this exposure limit further.

For example, in OSHA's preamble to its Cotton Dust Standard, the Agency determined that it should not lower the exposure limits for waste processing operations because there was

^{20/} Although portions of the Air Contaminants Standard were stayed by the U.S. Court of Appeals for the Eleventh Circuit in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir. 1992), OSHA continues to enforce the permissible exposure limits for air contaminants which were in place prior to 1992. (29 CFR 1910.1000 (Table Z-1))

not sufficient evidence that lowering the exposure limit beyond that already required by Table Z-1 would substantially reduce a significant risk. (50 FR 51120)^{21/} OSHA, however, has made no such determination with respect to the constituents of ETS which are currently being regulated by the Agency.

Philip Morris submits that OSHA has already determined that occupational exposure to ETS is covered under existing standards. In an opinion letter from OSHA to Mr. H. Brandon on March 3, 1988 (attached), regarding occupational exposure to tobacco smoke, the Agency stated:

The Occupational Safety and Health Administration (OSHA) does not have a standard on worker exposure to cigarette smoke in the workplace. OSHA does have an air contaminant standard, 29 CFR 1910.1000, Table Z-1, for the components of cigarette smoke, such as nicotine and carbon monoxide.

The letter concludes by recommending that Mr. Brandon call his area OSHA office for an inspection.

^{21/} See also, 57 FR 24310 (OSHA's Final Rule on Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite), where OSHA explained its decision not to regulate occupational exposure to non-asbestiform ATA because: "employees exposed to talc containing ATA will be protected under the Air Contaminants Standard (29 CFR 1910.1001). OSHA believes that application of the talc limit in the Air Contaminants Standard . . . will protect exposed employees against a significant risk of nonmalignant disease." 57 FR 24310, 24327. Therefore, OSHA concluded that it could not regulate exposure to a substance where it could not demonstrate that reducing the exposure level specified in the Air Contaminants standard could protect employees from a significant risk of harm.

As stated above, before OSHA can attempt to reduce occupational exposure to ETS, the Agency must justify its proposed standard by showing that there is a significant risk of material impairment to health from occupational exposure to ETS at the current Air Contaminants exposure levels and that this risk can be substantially reduced by lower exposure levels.

2. OSHA may not regulate insignificant risks

Under Benzene and its progeny, OSHA is precluded from regulating insignificant risks and only has authority to regulate significant risks to the point they become insignificant. To set a zero exposure limit, according to Benzene, OSHA must first demonstrate that any level of the substance, no matter how minute the exposure, poses a significant risk. (448 U.S. at 645) Only by actually quantifying and assessing the potential risk posed by various levels of ETS could OSHA even attempt to make such a demonstration.

In Benzene, OSHA set a permissible exposure limit for benzene at the lowest feasible level and banned all dermal contact with the substance without first demonstrating that any level, no matter how minute the exposure, posed a significant risk. OSHA relied on its carcinogen policy in effect at that time, which provided that "in the absence of definitive proof of a safe level, it must be assumed that any level above zero presents some

increased risk of cancer." (448 U.S. at 635-636) [emphasis added] OSHA contended that under that policy, if a safe level could not be proven, it was justified in regulating benzene to the lowest feasible level, which, in some cases, would be an outright ban.

Rejecting this aspect of OSHA's carcinogen policy, the Supreme Court made it very clear that OSHA's authority to promulgate safety and health standards is limited. The Court pointed out that "both the language and the structure of the [OSH] Act, as well as the legislative history, indicate that it was intended to require the elimination, as far as feasible, of significant risks of harm." (Id. at 641)

According to the Court, the legislative history supports the conclusion that "Congress was concerned, not with absolute safety, but with the elimination of significant harm." (448 U.S. at 646) The Court commented that "Congress specifically amended [29 U.S.C. § 655(b)(5)] to make it perfectly clear that it does not require [OSHA] to promulgate health standards that would assure an absolutely risk-free workplace." (48 U.S. at 646-647) The Court explained further:

By empowering the Secretary to promulgate standards that are 'reasonably necessary or appropriate to provide safe or healthful employment and places of employment,' the Act implies that, before promulgating any standard, the Secretary must make a finding that the workplaces in question are not safe. But 'safe' is not the equivalent of 'risk-

free.' There are many activities that we engage in every day -- such as driving a car or even breathing city air -- that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities 'unsafe.' Similarly, a workplace can hardly be considered 'unsafe' unless it threatens the workers with a significant risk of harm.

Therefore, before he can promulgate any permanent health or safety standard, the Secretary is required to make a threshold finding that a place of employment is unsafe -- in the sense that significant risks are present and can be eliminated or lessened by a change in practices.

(448 U.S. at 642) [emphasis added]

The Court reasoned that to allow OSHA to regulate a substance, no matter how minute the exposure, would constitute an unconstitutional delegation of legislative power:

In the absence of a clear mandate in the Act, it is unreasonable to assume that Congress intended to give the Secretary the unprecedented power over American industry that would result from the Government's view of [29 U.S.C. §§652(8) and 655(b)(5)], coupled with OSHA's cancer policy. Expert testimony that a substance is probably a human carcinogen -- either because it has caused cancer in animals or because individuals have contracted cancer following extremely high exposures -- would justify the conclusion that the substance poses some risk of serious harm no matter how minute the exposure and no matter how many experts testified that they regarded the risk as insignificant. That conclusion would in turn justify pervasive regulation limited only by the constraint of feasibility. In light of the fact that there are literally thousands of substances used in the workplace that have been identified as carcinogens or suspect carcinogens, the Government's theory would give OSHA power to

impose enormous costs that might produce
little, if any, discernible benefit.

(448 U.S. at 645) [emphasis added]^{22/} The Court thus concluded that an interpretation of the OSH Act that would give OSHA such "unprecedented power" to ban "any level" of a carcinogen, "no matter how minute the exposure," with "little, if any, discernible benefit" was both unreasonable and unlawful, absent a clear legislative mandate.^{23/}

The Court also noted that § 6(b)(5) of the OSH Act suggests that a ban is unwarranted unless it can be established that a significant risk exists at any level of exposure. "While [§

^{22/}In his concurring opinion, Chief Justice Burger made this same point, stating, "Perfect safety is a chimera; regulation must not strangle human activity in the search for the impossible." (448 U.S. at 664)

^{23/}The Court also pointed out that OSHA's goal of eliminating all carcinogens from the workplace was an unconstitutional usurpation of legislative power. Specifically, the Court concluded:

If the Government were correct in arguing that neither §3(8) nor §6(b)(5) requires that the risk from a toxic substance be quantified sufficiently to enable the Secretary to characterize it as significant in an understandable way, the statute would make such a 'sweeping delegation of legislative power' that it might be unconstitutional A construction of the statute that avoids this kind of open-ended grant should certainly be favored.

(448 U.S. at 646 (quoting A.L.A. Schechter Poultry Corp. v. United States, 295 U.S. 495, 539, 79 L.Ed. 1570, 55 S.Ct. 837 (1935) and Panama Refining Co. v. Ryan, 293 U.S. 388, 79 L.Ed. 446, 55 S.Ct. 241 (1935)))

6(b)(5)] requir[es] the Secretary to promulgate the standard that 'most adequately assures [to the extent feasible] . . . that no employee will suffer material impairment of health or functional capacity,' [it] also contains phrases implying that the Secretary should consider differences in degrees of significance rather than simply a total elimination of all risks." (Id. at 643, n. 48) According to the Court, a workplace ban on a substance like ETS requires more than a finding by OSHA that a significant risk exists at current, unregulated levels. The Agency must determine that the risks at any levels, even minute levels, are significant.

In defense of its standard in the Benzene case, OSHA argued that the language of § 3(8) merely means that the Agency is not required to eliminate insignificant risks, but that § 6(b)(5) called for the regulation of any risks posed by toxic or harmful physical substances. The Court responded that such "interpretation [was] at odds with Congress' express recognition of the futility of trying to make all workplaces totally risk free." (448 U.S. at 650) Summing up OSHA's limited rulemaking authority and referring to the Agency's recognition of not being required to regulate insignificant risks, the Court asserted: "It is entirely consistent with this interpretation to hold that the Act also requires the Agency to limit its endeavors in the standard-setting area to eliminating significant risks of harm." (448 U.S. at 651) As a result, OSHA's standard-setting authority is expressly limited to eliminating or reducing significant risks. It is not within the

realm of OSHA's authority to regulate exposure to substances which it has failed to establish on the basis of substantial evidence pose a significant risk of material harm. Thus, OSHA may not regulate insignificant risks.

Further addressing the OSH Act's legislative history, the Court noted that "Congress repeatedly expressed its concern about allowing [OSHA] to have too much power over American industry." (448 U.S. at 651) For instance, Congress refused to give OSHA the power to unilaterally close plants because of an alleged imminent danger, and narrowly circumscribed OSHA's power to issue emergency temporary standards. (Id.) According to the Court:

This effort by Congress to limit the Secretary's power is not consistent with a view that the mere possibility that some employee somewhere in the country may confront some risk of cancer is a sufficient basis for the exercise of the Secretary's power to require the expenditure [or cost to industry] of hundreds of millions of dollars to minimize that risk.

(448 U.S. at 651-652) [emphasis added] In sum, the Court's review of the legislative history of the federal Act clearly demonstrates that OSHA's authority to regulate toxic materials or harmful physical agents is limited to significant risks.

Directly in response to the Supreme Court's decision in Benzene, OSHA amended its cancer policy to no longer require exposure reduction to the "lowest feasible level." (46 FR 5881)

The new policy recognizes OSHA's duty to establish a significant risk and its limited authority to reduce or eliminate that risk.

In addition, subsequent to the decision in Benzene, a majority of the Supreme Court recognized the two pronged significant risk test. (See, American Textile Manufacturers Institute, Inc. v. Donovan, 452 U.S. 490, 505, n. 25, 69 L. Ed.2d 185, 101 S. Ct. 2478 (1981)) The Courts of Appeals have elaborated on these requirements and how they prevent OSHA from regulating insignificant risks.

In International Union, UAW v. Pendergrass, 878 F.2d 389 (D.C. Cir. 1989), the court held that OSHA failed to sufficiently explain its finding of insignificant risk of an exposure level of 1 ppm for formaldehyde. In promulgating the standard, the Agency set a permissible exposure limit (PEL) of 1 ppm in conjunction with a short-term exposure limit (STEL) of 2 ppm. It reasoned that the PEL combined with a STEL was likely to decrease risks from formaldehyde exposure to a level at which those risks are insignificant. One issue in the case centered on why OSHA chose the 1 ppm exposure level as posing an insignificant risk. As it turned out, the Agency was confronted with conflicting estimates of risk at particular levels. Rather than automatically setting a PEL according to the higher risk estimate (thereby requiring a lower PEL), OSHA accorded more weight to the lower risk estimate and implemented a PEL and a STEL so as not to regulate insignificant

risks. While the Court remanded the case to OSHA for reconsideration of its risk calculations, the case illustrates OSHA's recognition that it cannot regulate insignificant risks.

The D.C. Circuit faced a similar issue in Building & Construction Trades Department, AFL-CIO v. Brock, 838 F.2d 1258 (D.C. Cir. 1988), by examining whether OSHA had successfully carried its burden of proving that a total ban was reasonably necessary to reduce a significant risk. In that case, OSHA banned spraying of any and all products containing asbestos. OSHA also claimed to find support for its ban in the fact that both the EPA and the State of California had imposed similar bans. However, the Brock court found that evidence in the rulemaking record indicated that the modern process of encapsulating spray-on asbestos products ensures that asbestos fibers are not released on application. According to the court, OSHA failed to refute that claim.

In striking down the ban on spraying of any and all products containing asbestos, the Court found the ban to be overly broad, stating that OSHA failed to meet the substantial evidence standard imposed by the OSH Act. Although the court did not specify that OSHA failed to demonstrate the requirement that the ban be reasonably necessary, it is clear that the Agency could not show that completely prohibiting the spraying of any and all forms of asbestos was reasonably necessary to reduce a significant risk of material health impairment.

In United Steelworkers of America, et al. v. Marshall, 647 F.2d 1189 (D.C. Cir. 1980), a decision issued immediately after Benzene, the court reviewed the significant risk requirements. The Steelworkers court cited Benzene for the proposition "that Congress had not mandated OSHA to seek an absolutely risk-free workplace or to require industry to eliminate even insignificant risks of harm so long as the effort is not technologically impossible or financially ruinous." (Id. at 1246, citing Benzene, 448 U.S. at 641) [emphasis added] Furthermore, the Steelworkers court asserted that § 3(8) appears to require OSHA to establish a significant risk at the PEL that it sets.

In mentioning this second aspect of the threshold requirement -- whether the significant harm at the current level can be eliminated or lessened by a change in the PEL -- the plurality implies that § 3(8) requires OSHA to prove by specific evidence the level of risk at the new PEL, as well as the current PEL. The plurality leaves this point somewhat unclear, but in any event, a requirement of such proof would seem to follow from the second statutory provision governing OSHA's toxic agents standards, § 6(b)(5).

(Id. at n. 85)

The court touched upon the exact issue which becomes relevant in attempting to ban a substance. OSHA may only regulate significant risks. It is neither required nor authorized to regulate insignificant risks. It may not ban a substance without determining that any level of exposure, no matter how minute, poses a significant risk.

The Second Circuit has also addressed OSHA's lack of authority to regulate insignificant risks. In Pratt & Whitney Aircraft, et al. v. Secretary of Labor, 715 F.2d 57 (2d Cir. 1983), an enforcement proceeding, the court asserted that the "test employed by the [Review] Commission 'would permit this safety standard to be applied to conditions posing insignificant risks that are beyond the scope of the [OSH] Act.'" Id. at 59, quoting Pratt & Whitney Aircraft, et al. v. Secretary of Labor, 649 F.2d 96, 104 (2d Cir. 1981). The Court supported this assertion by referring to Benzene. According to the Second Circuit, and others, OSHA is prohibited not only from promulgating a new standard that reduces only insignificant risks, it may not enforce heretofore unchallenged or existing standards that reduce insignificant risks.

In addition to the courts, OSHA itself has acknowledged that the OSH Act limits its authority to requiring elimination of significant risks only. (Glycol Ethers Proposed Rule, 58 FR 15526, 15547, citing, Benzene, 448 U.S. at 644, n. 49) (See also, Cadmium Final Rule, 57 FR 42102, 42103; Air Contaminants for Maritime, Construction, and Agriculture Industry Sectors, Proposed Rule 57 FR 26002, 26034; Bloodborne Pathogens Final Rule, 56 FR 64004, 64005; Benzene Final Rule, 52 FR 34460, 34465)

More recently, in the Final Rule for Personal Protective Equipment for General Industry, published April 6, 1994, 59 FR 16334, OSHA recognized the limits the OSH Act places on its

rulemaking authority. In the preamble, the Agency asserts that it "has long followed the teaching that § 3(8) of the OSH Act requires that, before it promulgates 'any permanent health or safety standard, [it must] make a threshold finding that a place of employment is unsafe -- in the sense that significant risks are present and can be eliminated or lessened by a change in practices.'" (59 FR at 16357, citing Benzene, 448 U.S. at 642) Moreover, the Agency, citing § 6(a) of the Act, asserted that Congress' instruction to OSHA to summarily adopt national consensus and existing federal standards establishes a reference point "concerning the least an OSHA standard should achieve." (59 FR at 16357) Reasoning from this point, OSHA determined that it "is precluded from regulating insignificant safety risks or from issuing safety standards that do not at least lessen risks in a significant way." (Id.) [emphasis added]

On June 2, 1994, OSHA, in its publication of a Proposed Rule for Longshoring and Marine Terminals, expressed the same reasoning and came to the same conclusion. (59 FR 28594) OSHA is precluded from regulating insignificant risks. (58 FR 28598) As OSHA explained, based on both judicial and Agency interpretation, "the OSH Act sets clear and reasonable limits for Agency rulemaking action." (Id.; 59 FR at 16357)

OSHA has also recognized its limited authority in the promulgation of health standards. In fact, the Agency acknowledged

this limitation to also preclude it from regulating a substance below levels at which the risks from exposure become insignificant. The promulgated standards for air contaminants in maritime, construction, and agriculture industry sectors, 57 FR 26002; bloodborne pathogens, 56 FR 64004; cadmium, 57 FR 42102; and benzene, 52 FR 34460, all expressly recognize OSHA's lack of authority to regulate insignificant risks.

In addition, the Agency, in its Air Contaminants Final Rule, asserted that in promulgating a health standard its aim "is to set the lowest feasible level necessary to eliminate significant risks." (54 FR at 2332, 2361; see also, Proposed Rule for Maritime, Construction, and Agriculture Sectors, 57 FR at 26034) The Agency draws this "aim" from the significant risk requirement of Benzene and the court's language in Cotton Dust that "a cost benefit analysis is not required by statute because a feasibility analysis is." (452 U.S. at 531, n. 32) Thus, the Agency recognizes that its goal is not to achieve the lowest feasible level of exposure. Rather, the OSH Act places dual limitations on OSHA's authority to promulgate standards. First, the standard must be technologically and economically feasible. Second, even if a lower standard is feasible, it must be necessary to eliminate or reduce a significant risk. In other words, OSHA may regulate a risk to the point it is no longer significant but no further. If a level of exposure to a substance like ETS exists that does not

pose a significant risk of material health impairment, OSHA cannot promulgate a ban or otherwise regulate that insignificant risk.

OSHA has consistently acknowledged its limited authority through the painstakingly detailed analysis it undertakes in establishing significant risks and setting PELs. In the preamble to the final Benzene Standard, OSHA concluded that after "reviewing all the evidence and comments . . . the final standard is carrying out Congressional intent within the limits of feasibility and does not attempt to reduce insignificant risks." (52 FR at 34463) [emphasis added] See also, proposed rule for amendment to Air Contaminants Standard for Maritime, Construction, and Agricultural Industry Sectors, 57 FR 26002, 26049 ("OSHA is also confident that it is not attempting in this rulemaking to reduce exposure to insignificant levels") (emphasis added). The Agency made this statement after describing the threshold requirement of the Benzene decision, i.e., to establish that existing levels of benzene exposure posed a significant risk.

Similarly, in the preamble to the Cadmium Standard, OSHA asserted that by setting "a PEL of 5 ug/m³, [it was] assured that the Agency is not regulating an insignificant excess risk of cancer or kidney damage." The statement again indicates OSHA's recognition of two primary limitations on its authority to regulate a substance stemming from Benzene and its progeny. First, OSHA

must not regulate insignificant risks. Second, it is only the significant excess risk that the Agency is authorized to regulate.

Finally, in the preamble for the Bloodborne Pathogens Final Rule, OSHA also acknowledged its limited authority under the OSH Act. "OSHA believes the standard for bloodborne pathogens will reduce risks of HBV infection and material impairment of health from 83 to 113 per 1,000 to 3 to 5 per 1,000, the Agency is carrying out the Congressional intent and is not attempting to reduce insignificant risks." (56 FR at 64037) [emphasis added] Through this statement, OSHA estimates the excess risks remaining after implementation of the Bloodborne Pathogens Standard. In light of the Agency's policy of designating a risk of 1 in 1000 or higher as significant, it appears that a significant risk remains. Nevertheless, OSHA went to great lengths through this quantification to demonstrate that it was not regulating an insignificant risk.

In sum, the Supreme Court, every court of appeals that has addressed the issue, and OSHA have consistently interpreted §§ 3(8) and 6(b)(5) of the OSH Act as placing limits on the rulemaking authority of OSHA to regulate only significant risk.

3. OSHA has acknowledged that evidence is lacking to establish that any level of ETS in enclosed work areas poses a significant risk

In the NPR, OSHA expresses its position that the proposed standard "reduces significant risk to only a small percentage of the current risk. To the extent that there are failures of enforcement of the smoking limitation and of the ventilation system, the risk will not be totally eliminated." [emphasis added] (59 FR 16001) OSHA then proclaims, "Since there is no definition of, nor an established method for quantifying exposure, it is not possible to determine a 'dose limit' that would eliminate significant risk. Even if that were possible, it is not clear it would be the correct policy approach." (59 FR 16001)

OSHA's position absolutely defies the Supreme Court's ruling in Benzene that the Agency is only authorized to reduce a significant risk. According to the NPR, OSHA believes that it may "totally eliminate" risk, whether or not that risk is significant, where it is not possible to determine the "dose limit" that would eliminate significant risk. OSHA fails to cite to any authority for this belief and Philip Morris submits that no such authority exists. Nothing in Benzene, or any of the court cases interpreting Benzene, frees OSHA from the significant risk requirement when a so-called "dose limit" cannot be determined.

OSHA's inability to designate the point at which a risk becomes insignificant does not permit it to ban exposure to a particular substance. Rather, OSHA's authority is limited to regulating risks that it can establish on the basis of substantial evidence are significant. Nevertheless, despite OSHA's acknowledged lack of evidence on what amount of ETS causes the alleged significant risk, the Agency attempts to set a zero exposure limit for nonsmoking employees.

OSHA did not even attempt to establish that any level of ETS, no matter how minute the exposure, poses a significant risk. In fact, there is scientific debate as to whether there may be a level of ETS at which any alleged risk would be insignificant. Dr. Steven Bayard of the EPA, who was a coauthor of the Agency's ETS risk assessment, which OSHA relies upon so heavily, testified before the Maryland Occupational Safety and Health (MOSH) Advisory Board on December 16, 1993, that he thought that a threshold level did exist below which any risk posed by ETS is insignificant. When asked by a Board Member: "[D]o you believe that there is a level of environmental tobacco smoke at which a person who's exposed will not suffer material impairment of health or functional capacity?" Dr. Bayard responded, "The answer is, certainly." (Transcript, Vol. II, page 297, lines 2-7) [emphasis added] Dr. Bayard responded further:

And some of these people that are coming down with these diseases are just highly sensitive populations, and so you're not dealing with a normal population, I don't think. I think

you're dealing with normal people and then
you're dealing with highly sensitive people.

So, yes, certainly.

Id. at lines 13-18.

Mr. James Repace of EPA also believes that a threshold of exposure exists below which there is no significant risk of material health impairment. Mr. Repace contributed to the risk assessment in the EPA Report and is heavily relied upon by OSHA in its NPR. He testified before the MOSH Advisory Board on December 9, 1993 that 7 or 8 nanograms of nicotine per cubic meter is "an insignificant or trivial risk." Transcript, Vol. I, page 180, lines 5-13.

In addition, the March 1994 Congressional Research Service (CRS) Report for Congress on the use of cigarette taxes to fund health care reform found plausible the existence of an exposure threshold. The authors stated:

The existence of an exposure threshold for disease below which many passive smokers fall is not implausible. Some organisms have the capacity to cleanse themselves of some level of contaminants. It is for this reason that public policy usually does not insist that every unit of air or water pollution be removed from the environment; the damage of low levels of pollutants is sufficiently small (through the self-cleansing process) that removal is not cost effective. In fact, strongly nonlinear relationships in which health effects rise with the square of exposure, and more, have been found with respect to active smoking (See, Surgeon General's Report, 1989, p. 44). Were these

relationships projected backward to construct the lower (unknown) portion of the health effects/physical damage function, the observed relationship might lead researchers a priori to expect no empirical relationship. Thus, the issue raised by this potential break in the causative chain is whether researchers should expect to find a significant relationship between passive smoking and health effects. (p.45) [emphasis added]

Despite this acknowledged lack of data to support the assumption that any level of ETS poses a significant risk, and despite the data that a threshold level may exist below which the risk, if any, posed by ETS is insignificant, OSHA proposes to mandate a zero exposure limit for non-smoking employees and thereby allegedly guarantee absolute safety. According to Benzene, OSHA may not rely on such an unsupported assumption or policy.

4. OSHA's proposed zero exposure limit does not significantly reduce the alleged significant risk because of non-workplace "background" exposure

In addition to holding that OSHA may not regulate insignificant risk, the Benzene Court asserted that OSHA standards must significantly reduce the hazard risk.

Exposure to a substance in locations other than an employee's workplace, such as in the home or other "background" exposure sites, may prevent a standard from achieving such a significant reduction. OSHA itself implicitly recognized this when

regulating benzene. Instead of banning the substance outright, OSHA "began with a 1 ppm level, selected in part to ensure that employers would not be required to eliminate benzene concentrations that were little greater than so-called background exposures experienced by the population at large." (448 U.S. at 650) [emphasis added] The National Institute for Occupational Safety and Health (NIOSH) had recommended the 1 ppm permissible exposure level ("PEL") to OSHA, "because any lower standard might require the elimination of the small amounts of benzene (in some places up to 0.5 ppm) that are normally present in the atmosphere." (448 U.S. at 621 n.14) [emphasis added] Thus, through other regulatory efforts, both OSHA and NIOSH have recognized that lowering of PELs must stop when no further significant reduction of risk would be achieved because of "background" exposures.

The D.C. Circuit, in Public Citizen Health Research Group v. Tyson, 796 F.2d 1479 (D.C. Cir. 1986) ("Ethylene Oxide"), acknowledged that "background" exposure is a factor that OSHA must consider in determining whether a standard significantly reduces the risk. The Court observed that for a short term exposure limit (STEL) to achieve a risk reduction, workplace ethylene oxide exposure patterns had to be characterized by "low background levels and high intermittent exposures": i.e., workplace exposure levels had to be quantitatively greater and qualitatively different from those experienced by the general public in non-workplace settings. (796 F.2d at 1506) Since OSHA had "made no findings at all on

patterns of exposure," the Court held that OSHA "improperly assumed that exposure scenarios will eliminate the need for a STEL." (796 F.2d at 1507) [emphasis added] The Court remanded the standard to OSHA for further consideration, stating: "On remand, we expect the Agency to ventilate the issues on this point thoroughly and either adopt a STEL or explain why empirical or expert evidence on exposure patterns makes a STEL irrelevant to controlling long-term average exposures." (Id.) [emphasis added]

Similarly, before OSHA may ban smoking from the work areas of enclosed workplaces, it must address patterns of "background" exposure: i.e., the impact, if any, on employee health of ETS exposure outside the workplace. This means finding "substantial evidence" to support the proposition that any ETS increase, no matter how minute, in workplace exposure -- above and beyond the employee's non-work "background" exposure levels -- will significantly increase the risk of material health impairment to a significant level. Only by showing this can OSHA demonstrate that a zero exposure workplace limit is reasonably necessary to significantly reduce that significant risk. OSHA has not even attempted to address this issue.

5. OSHA failed to demonstrate that its choice from among alternative regulations was reasonably necessary to significantly reduce the alleged risk
 - a. OSHA must adequately consider alternative regulations and offer a reasonable explanation for its choice from among those alternatives

The federal courts have explained that in promulgating an occupational safety and health standard, OSHA must consider degrees of risk and alternative kinds or levels of regulation. The Supreme Court in Benzene noted that it is implicit in the OSH Act that "the Secretary should consider differences in degrees of significance rather than simply a total elimination of all risks." (Id. at 643 n.48) [emphasis added]

Similarly, in Dry Color Manufacturers' Ass'n v. Department of Labor, 486 F.2d 98 (3rd Cir. 1973), the Third Circuit Court of Appeals ruled that OSHA must provide "at least a general explanation as to why the procedures prescribed were chosen in light of . . . the alternative kinds of regulations considered by OSHA." Furthermore, OSHA must consider alternative approaches that could achieve the same goals, in this case the reduction of significant risk, with minimal economic impact. Pursuant to Executive Order 12291, OSHA must conduct a Regulatory Impact Analysis (hereinafter "RIA") which includes:

a description of alternative approaches that could substantially achieve the same regulatory goal at lower costs, together with an analysis of the potential benefit and costs, and a brief explanation of the legal

reasons why such alternatives, if proposed, could not be adopted;

(Executive Order 12291, § 3(d)(4)) Moreover, OSHA is under a statutory obligation to perform a Regulatory Flexibility Analysis (hereinafter "RFA") "describ[ing] the impact of the proposed rule on small entities." (5 U.S.C. 603(a)) The RFA must include:

[A] description by (sic) any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

(Id. at 603(c))

In the instant situation, OSHA has failed to satisfy its obligation to examine alternative kinds of regulation under this proposed standard and to explain the choice it made from among the available alternatives.

- b. OSHA has failed to offer a reasonable explanation for its choice from among sufficiently effective alternative regulations

As stated previously, OSHA is charged with eliminating exposures that purportedly create significant risk, not any possible risk. Philip Morris submits that OSHA has failed to consider alternatives, including the physical separation of smokers and nonsmokers, providing adequate ventilation, or even restricting smoking to designated areas with negative pressure ventilation (but

without direct exhaust to the outdoors), which would reduce exposure and hence any alleged significant risk to a level at which it is no longer significant. Choosing to ignore these alternatives, OSHA failed to offer a reasonable explanation for choosing the most restrictive alternative, i.e., a ban on smoking in areas where employees work.

c. Alternative regulations would be less burdensome than the proposed standard

In the NPR, OSHA states "that control of pollutants at the source is the most effective strategy for maintaining clean indoor air In the case of ETS, this means restricting smoking to separately ventilated spaces." (59 FR 15968)

Philip Morris submits that the proposed standard places a significantly greater burden on employers, with no corresponding reduction in risk, than would be imposed by equivalent effective alternatives which OSHA failed to consider. The proposed standard requires that designated smoking areas be "enclosed and exhausted directly to the outside." This requirement may be cost prohibitive for many employers, depending on the facility and size of the company. In addition, the requirement that smoking room air be "maintained under negative pressure sufficient to contain tobacco smoke within the designated area" would likely burden most employers with the expense of purchasing and installing the duct work necessary to direct smoking room air to the outside, the

expense of purchasing and installing fans capable of maintaining the required negative pressure, the expense of energy to operate the fans, and the expense to heat or cool intake air to replace the air exhausted from the smoking room. By comparison, what are the costs of monitoring to ensure compliance with a permissible exposure limit, policing employee habits to ensure separation of smokers and nonsmokers, or maintaining the general ventilation rate at applicable standards?

OSHA failed to adequately estimate the costs of alternatives to the proposed standard, something which it is required to do.^{24/} Philip Morris submits that none of the alternative controls that OSHA failed to consider could be any more burdensome than the proposed standard. Although OSHA may believe that a ban is the easiest and least costly method of reducing ETS exposure, this belief is premised on an assumption that the employer does not want to permit any form of workplace smoking. For the employer who desires to accommodate the preferences of both its smoking and nonsmoking employees, the proposed regulatory scheme for ETS is unduly burdensome and costly. Other options, such as those discussed below, must be considered.

^{24/}For example, in OSHA's advanced notice of proposed rulemaking on the reevaluation of the Cotton Dust Standard, OSHA asked for comments on the question of whether there are more "cost effective ways of reducing cotton dust related illnesses." (47 FR 5906, 5909 (1982))

(1) General workplace smoking accommodation

For many years, large and small groups of smokers and nonsmokers have worked together. If disputes arose, settlements were reached through discussion and negotiation. Many successful companies have adopted an informal approach to workplace smoking using a minimal level of administrative structure and supervision to address individual complaints. Complaints about exposure to tobacco smoke typically have been addressed by employers through effective, common sense responses such as:

1. Increased outdoor air ventilation to levels specified in local building codes, or more recently, to levels such as those specified in ASHRAE Standard 62-1989 "Ventilation for Acceptable Indoor Air Quality;"^{25/}
2. Relocation of a workstation;
3. Grouping of smokers and nonsmokers;
4. Partitions in "open" office settings;
5. Use of fans or vents as may be appropriate;
6. Implementation of a smoking policy either designed to accommodate smokers and nonsmokers or reached through the collective bargaining process.

^{25/} ASHRAE Standard 62-1989 "Ventilation for Acceptable Indoor Air Quality" specifies "minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to avoid adverse health effects." Submitted in response to OSHA's RFI. (Ex. 3-1074)

In fact, the most recent Society for Human Resource Management survey of human resources executives indicates that 85% of companies adopted workplace smoking policies.^{26/} The percentage of companies implementing smoking policies has risen dramatically compared to the 36% of companies with policies in 1986. The large increase is evidence that smoking in the workplace is an issue designated for resolution through the employer/employee relationship.

Dr. Antonia C. Novello, Special Representative of Health and Nutrition, National Institutes of Health, testified before Congress regarding H.R. Bill 3434 on February 7, 1994, and elaborated on workplace smoking policies. (Attached) She acknowledged that 85% of private companies adopted policies to restrict or ban smoking. Moreover, she noted that 59% of worksites with 50 or more employees implemented formal policies that prohibited or severely restricted smoking. Clearly, these figures indicate that employers have addressed the issue of workplace smoking. Through the employment relations process, companies have reached mutually agreed upon policies tailored to specific worksites. The policies address issues unique to each environment and workforce and ensure satisfactory workplace conditions.

^{26/}"SHRM-BNA Survey No. 55: Smoking in the Workplace: 1991," Bulletin to Management, August 29, 1991, pages 1-16.

Philip Morris submits that such measures have been effective in addressing complaints about ETS and generally require few additional costs or expenditures from the employer. These remedies are based on the concept of accommodation for both smokers and nonsmokers and the belief that cooperation among smokers and nonsmokers can be fostered in the workplace. By failing to address these and other alternatives to the proposed standard, OSHA ignores the quickest, most cost effective and beneficial methods of addressing indoor air constituents.

(2) Increased general ventilation

Adequate ventilation, such as that specified in ASHRAE Standard 62-1989 ("Ventilation for Acceptable Indoor Air Quality"), can effectively and efficiently reduce levels of ETS constituents as well as levels of numerous other substances that may contribute to the quality of indoor air.

In the case of indoor office work environments, the ASHRAE Standard stipulates a minimum outside air ventilation rate of 20 cfm/person, which allows for a moderate amount of smoking. This ventilation rate, which has been adopted by various building code organizations and many municipalities through the U.S., is designed to address all kinds of substances in indoor air, including tobacco smoke. Therefore, with a 20 cfm/person ventilation rate, moderate smoking activity is accommodated.

Implementation of a generic ventilation-based indoor air quality standard, such as that recommended by ASHRAE, offers a comprehensive solution to poor indoor air quality. Adequate supply (outdoor) air intake and its appropriate distribution throughout occupied spaces serves to dilute and/or remove a wide range of substances potentially in the indoor air, including volatile organic compounds, carbon monoxide, carbon dioxide, constituents of ETS, radon and biologicals. Even though workplace office configurations are infinitely varied, the ventilation solution remains constant as the work activities of building tenants change over time.

(3) Simple separation of smokers and nonsmokers

No data exist which suggest that the dedicated smoking lounge, as proposed in the NPR, will significantly reduce exposure to ETS-related constituents beyond reductions achieved by appropriate ventilation and the simple separation of smokers from nonsmokers.

Recent studies on ETS constituent levels aboard commercial aircraft, including a 1989 study performed for the U.S. Department of Transportation, indicate the effectiveness of simple separation of smokers and nonsmokers in the minimization of ETS exposures. (See Ex. 3-1074) Similarly, Proctor (1987) monitored ETS constituents before and after a smoking ban on public transportation in the United Kingdom. While nicotine

concentrations decreased from 7 ug/m³ (micrograms per cubic meter) to 3 ug/m³ in nonsmoking compartments after the ban, particulate and CO levels remained unchanged. (See Ex. 3-1074) This suggests that ETS contributions to levels of particulates and CO are not significant. Thus, the submission to the OSHA RFI public docket from R.J. Reynolds observes:

Any assessment of the need for measures to supplement a generic standard with special provisions such as mandated smoking lounges with separate exhaust or a smoking ban to reduce further any residual levels of ETS would plainly reveal that such measures would only result in an insubstantial reduction of an already de minimis exposure level. Accordingly, the imposition of such measures as mandated smoking lounges or smoking bans would be impermissible under the Supreme Court's direction that OSHA is authorized only to eliminate significant risks and may not seek the 'regulation of insignificant risks.' (Ex. 3-1086)

The aforementioned data illustrate the extremely low levels of ETS constituents that are supposedly "transferred" from smoking to nonsmoking areas, even under conditions involving a shared ventilation system. As discussed in other sections of this comment, reported data indicate that ETS constituents in nonsmoking areas in buildings where smoking is permitted are often only slightly above the limits of detection, and often indistinguishable from levels that can be found in buildings in which smoking is altogether prohibited. Philip Morris submits that simple

separation of nonsmokers and smokers can adequately minimize nonsmoker exposure to environmental tobacco smoke.

(4) Designated smoking areas operating at negative pressure

Another alternative method of regulating workplace smoking without imposing excessive costs on employers would be to eliminate the requirement from the proposed standard that designated smoking areas have a separate exhaust system to the outside of the building. If designated smoking areas were simply required to operate at negative pressure with respect to the rest of the indoor space, employers would not have the additional cost of creating this separate exhaust system. Philip Morris submits that the available data indicate that in such situations the nonsmoker exposure to ETS will be, at most, minimal. See discussion elsewhere in this comment. The designation of smoking areas with negative pressure could be accomplished at less cost than OSHA's proposed standard.

From an engineering and policy perspective, designated areas (including, but not limited to enclosed smoking rooms) operated under negative pressure have been embraced in a variety of contexts. For example, many restaurants operate designated areas such as the kitchen and smoking areas under negative pressure. Hospitals frequently operate certain rooms or wards, such as a TB ward, under negative pressure. Manufacturing firms utilize

negative pressure to assist in developing and maintaining "clean rooms" and other controlled environments. Hayward, et al., in their article "Effectiveness of Ventilation and Other Controls in Reducing Exposure to ETS in Office Buildings" (November 1993), note that the pressure relationships governing air movement in the building relative to smoking areas are a component of a mechanism to control recirculation of, or exposure to, ETS. (Submitted at Section XI of this comment.)

With respect to OSHA's concerns regarding the recirculation of air from smoking areas to nonsmoking areas, Philip Morris submits that the published literature also demonstrates that recirculation is a viable option over the separate exhaust requirement imposed by OSHA.

For example, in 1991, Hedge, et al., reported results of ETS constituent measurements taken in buildings with different smoking policies. For most constituents, the researchers reported no significant differences in concentrations among offices in smoking prohibited buildings and nonsmoking office areas in buildings where smoking was restricted to (1) rooms with local filtration, (2) areas with no local air treatment, (3) rooms with separate ventilation or (4) open workstations and enclosed offices. (See Ex. 3-1074) Further, investigators from Healthy Buildings International recently summarized results of their paper entitled "The Measurement of Environmental Tobacco Smoke in 585 Office

Environments." Using measured nicotine and particulate levels as markers for the presence of ETS, the investigators reported "spillover" of ETS in only 4% of the offices investigated. (See Ex. 3-1074)

The data, therefore, support the contention that designated smoking areas operated under negative pressure can essentially eliminate ETS exposure in nonsmoking areas, even under conditions of recirculation.

III. OSHA HAS NEITHER CONDUCTED A PROPER
REGULATORY IMPACT ANALYSIS NOR
ADEQUATELY EVALUATED THE ECONOMIC
IMPACT OF THE PROPOSED STANDARD

A. Assessing the costs of the standard

In an effort to increase accountability for regulatory action, federal agencies must prepare a preliminary and final Regulatory Impact Analysis (RIA) for each major rule. To the extent permitted by law, each RIA must contain:

- (2) a description of potential costs of the rule, including any adverse effects that cannot be quantified in monetary terms, and identification of those likely to bear costs;

(Executive Order 12291)

While the Supreme Court in Cotton Dust supra, held that OSHA may not conduct a formal cost benefit analysis in its standard setting procedure, the Agency must still comply with the Executive Order. In conducting the RIA, the Agency must assess the costs and adverse effects of the proposed standard. In the instant situation, OSHA has developed no information whatsoever on demolition, design, installation, or material costs for separately ventilated designated smoking areas; revenue or sales losses for businesses affected by patron desertion; Agency enforcement expenses; or the loss of state revenues due to reduced sales of taxable tobacco products.

Rather, OSHA merely asserts that the average cost of "retrofitting the HVAC system [for a designated smoking area that complies with the proposed standard] ranges from \$4,000 for a 150 square feet room . . . to \$25,000 for 1,000 square feet" (59 FR at 16018) Moreover, in making its industry wide cost projections, OSHA assumed that "50 percent of all eating and drinking places and hotels and other lodging places may provide separate designated smoking areas." (Id.) However, the Agency's own interpretation of the standard prohibits the performance of work in a designated smoking area. Following this interpretation, OSHA has effectively banned smoking in such establishments as restaurants and hotels as no restaurant or hotel could require an employee to work in an area designated for smoking. In sum, OSHA failed to consider monetary costs and other adverse effects the standard will have on these businesses.

B. Economic feasibility

Section 6(b)(5) of the OSH Act provides that a standard developed to address with employee exposure to toxic materials or harmful physical agents shall adequately ensure, to the extent feasible, that no material health impairment will ensue. Although OSH Act §3(8), the definition of an occupational safety and health standard, by its terms does not require a feasibility analysis, the Supreme Court stated that "any standard that [is] not economically or technologically feasible would a fortiori not be 'reasonably

necessary or appropriate' under [federal law]." (American Textile Manufacturers, 452 U.S. 490, 513 n. 31 ("Cotton Dust"))

An "economic feasibility" evaluation does not require a cost-benefit analysis. (Cotton Dust, 452 U.S. at 507, n. 26; 43 FR at 27379) However, Philip Morris submits that OSHA "must . . . provide a reasonable assessment of the likely range of costs of its standard, and the likely effects of those costs on the industry," United Steelworkers, 467 F.2d at 1266, so as to "demonstrate a reasonable likelihood that these costs will not threaten the existence or competitive structure of an industry, even if it does portend disaster for some marginal firms." (467 F.2d at 1272) OSHA must support an economic evaluation with substantial evidence, and must address the impact of the regulation on all affected industries. (967 F.2d at 301 n. 160. Accord, AFL-CIO v. OSHA, 965 F.2d 962, 982 (11th Cir. 1992) (the determination of economic feasibility is governed by the same principle as technological feasibility; it must be supported by substantial evidence and OSHA must demonstrate its applicability to the affected industries); ASARCO, Inc. v. OSHA, 746 F.2d 483, 500 (9th Cir. 1984))

OSHA may not conduct the economic feasibility analysis by broadly grouping together various components of an industry "sector," (defined by the two-digit SIC code) absent a specific explanation of why such overbroad generalities are appropriate. (AFL-CIO v. OSHA, 965 F.2d at 982) As the Eleventh Circuit

recognized, reliance on "tools [such] as average estimates of cost can be extremely misleading in assessing the impact of particular standards on individual industries. Analyzing the economic impact for an entire [industrial] sector could conceal particular industries laboring under special disabilities [which are] likely to fail as a result of enforcement." (965 F.2d at 982)

In contrast, OSHA properly analyzed economic feasibility where it quantified the specific costs for each separate noise standard regulatory requirement to reach a total cost per industry worker. (Forging Industry Association v. Secretary of Labor, 773 F.2d 1436 (4th Cir. 1985)) The Fourth Circuit commented: "With respect to each component, [OSHA] exhaustively analyzed and evaluated data submitted by the industry and the scientific community and fully explained the basis of its computations." (773 F.2d at 1453) The final economic analysis in Forging Industry was based on quantified costs of audiometric testing, total number of workers, decreased production due to test requirements, test fees, time lost because of physician referrals, and implementation costs, such as test booth, audiometer, and accessory expenses, operator certification costs and equipment calibration fees. (773 F.2d at 1453-54) The court found that substantial evidence adequately supported OSHA's economic feasibility estimate.

Philip Morris submits that "the undisputed principle that feasibility is to be tested industry-by-industry demands that OSHA

examine the [economic] feasibility of each industry individually." (965 F.2d at 980 (citations omitted)) Nevertheless, OSHA conducted its economic feasibility analysis at the two-digit SIC code level in defiance of the Eleventh Circuit's finding in Air Contaminants. Further, OSHA estimated only the compliance cost as a percentage of revenue and profit. It failed to consider the other economic effects of implementing the proposed standard. The only explanation OSHA offered for its inadequate analysis was that "[t]his has been [its] procedure for doing regulatory impact analyses. . . ." (59 FR at 16108) By grouping affected industries into such broad classifications and failing to consider the economic impact of the standard on an industry by industry basis, OSHA failed to establish that its proposed standard is economically feasible.

IV. PRACTICAL CONSIDERATIONS POSED BY THE SCOPE OF THE PROPOSED STANDARD

- A. The proposed standard's smoking restrictions apply in situations over which OSHA has no rational basis to regulate, and do so in a manner never before used by the agency

The proposed standard's smoking restrictions apply to "all indoor or enclosed workplaces under OSHA jurisdiction." (29 C.F.R. 1910.1033(a)(2)) The OSH Act, however, does not define "workplace." Instead, the Act uses the definitions of "employers" and "employees" to define OSHA's jurisdiction. The Act defines "employer" as "a person engaged in a business affecting commerce who has employees, but does not include the United States or any State or political subdivision of a State." (29 U.S.C. § 652(5)) "Employees" are defined as "an employee of an employer who is employed in a business of his employer which affects commerce." (29 U.S.C. § 652(6))

The approach taken in this proposal to apply the standard to workplaces as opposed to employee exposures is unique in OSHA regulatory history of toxic substances. Rather than basing regulatory requirements on employee exposure, as every standard OSHA ever promulgated addressing a toxic substance has done, the regulation actually uses enclosed work environments as a surrogate for employee exposure. Actual employee exposure is meaningless; it is the "room" that must be protected. As a result, the proposed regulation makes no distinction between one cigarette smoked in an enclosed football stadium over one hundred yards from the nearest

employee and 10 cigarettes smoked simultaneously in a small unventilated conference room. In the eyes of the regulation, both situations pose an equal risk to an employee. This causes the proposed regulation to apply in situations where clearly no rational justification for regulation exists.

In addition, the concept of eliminating exposure in places as opposed to addressing exposure to employees also becomes unworkable when the concept of time is introduced. Because it is the act of smoking in the enclosed workplace that is regulated, not the level of employee exposure to tobacco smoke, time becomes meaningless. For example, the regulation could have the effect of banning smoking in an office which did not meet the specifications of a designated area. What would an employer's obligation be if a nonemployee had smoked one cigarette in that office, when no employees were present, one minute before an employee entered? One hour before? The day before? On the face of the regulation the employer could not require the employee to enter that office, even if the one cigarette had been smoked months or years before. Language in the preamble would go even further and prohibit the employee from entering the office even if he or she wanted to. Obviously, this makes no sense.

The following examples illustrate the problems that arise from the application of the regulation consistent with the preamble's interpretation and the proposed regulatory text.

1. Private residences

The proposed standard covers private residences, raising the prospect of OSHA citing homeowners and home service companies for exposing their employees to ETS. The IAQ portions of the proposed standard apply only to non-industrial workplaces, which are defined to expressly exclude manufacturing or production facilities, residences, vehicles and agricultural operations; however, the ETS portion of the proposed standard applies to "all indoor or enclosed workplaces," which clearly implies that all of these workplaces would be covered. Where a housekeeper, nanny, nurse, repair person, delivery person, or any other employee performs work in a private residence, the proposed standard would require the employer (i.e., either the homeowner or home service contractor) to restrict smoking in the home to a designated smoking room meeting the specifications of the standard. This room must not be where any work is to be performed. Homeowners who cannot afford to install such designated smoking rooms would be required to prohibit smoking in their homes entirely.

Because the proposed standard does not specify when smoking must be prohibited, and because the preamble's mandate is that an employee cannot be required to work where "contamination" from ETS is present (59 FR 16001), every home that may at some time or another be a workplace would have to be smoke-free, even though

no employees may have been present in the home for days, weeks, months or years.

Similarly, the proposed standard does not specify when "no smoking" signs must be posted at the entrances of workplaces, including homes. (29 C.F.R. § 1910.1033(e)(1)(vi)) Thus, the proposed standard would seem to require that such signs be posted continually, presumably at all entrances to private residences.

2. Hotels and motels

The proposed standard would also cover sleeping rooms in hotels and motels because service, custodial, and maintenance staff are regularly employed in such rooms. Like the restriction on smoking in the home, the proposed standard would prohibit smoking in hotel rooms at all times, not just while employees are working in the room, because of "contamination" due to ETS. Even though the proposed standard permits custodial and maintenance employees to work in unoccupied designated smoking areas (29 C.F.R. § 1910.1033(e)(1)(iii)), smoking would still be prohibited in sleeping rooms of hotels and motels because other employees, such as bellhops and room service employees, are required to enter the room.

3. Restaurants, bars, and other service establishments

The proposed standard would also cover restaurants and bars, bowling alleys, and other service establishments. Because designated smoking areas in such establishments must not be work areas, customers could not smoke at tables or bars where waiters and bartenders work. This restriction would effectively ban smoking by patrons of restaurants and bars entirely, as well as at catered private parties, bowling alleys, pool halls, bingo halls, casinos, etc. Such an effect would undoubtedly have a significant negative economic impact. This same restriction on customer smoking would also apply to retail establishments, shopping malls, indoor sports arenas, and any other enclosed public area where there is just one person who fits the broad definition of "employee."

4. Nursing homes

Nursing homes and long term health care facilities will be faced with unique hardship if OSHA promulgates the proposed standard. These facilities are required by the Social Security Act to recognize numerous "Residents' Rights." Among these rights, a resident has the right to "make choices about aspects of his or her life in the facility that are significant to the resident." (42 C.F.R. § 483.15(b)(3)) In its interpretive guidelines, the U.S. Department of Health and Human Services also states that any

nursing facility that chooses to prohibit smoking "must allow current residents who smoke to continue smoking in an area that maintains the quality of life for these residents." (Interpretive Guidelines, § 483.15(b)(3)) Although the guidelines allow nursing homes to designate outdoor areas for smoking, the facility must provide an alternative area on days when the weather could make it unsafe or unhealthy to smoke outside.

According to these guidelines, nursing homes are effectively foreclosed from prohibiting smoking. As a result, most, if not all, nursing homes are currently accommodating their residents who are smokers. The proposed standard would, in effect, require nursing homes to build designated smoking areas that meet the specifications of the standard.

However, nursing home employees would be prohibited from entering designated smoking areas at all times, except to perform custodial or maintenance work when smoking is not taking place. This means that a nurse would be legally prohibited from pushing a wheelchair-bound resident into the designated smoking area, and from rendering emergency medical treatment to a resident who might require treatment while in a designated smoking area, even when smoking is not taking place.

5. Vehicles

The proposed standard would prohibit employees from smoking in vehicles used in the course of employment, even with all of the windows open. Such vehicles, whether a company truck or an employee's personal car, are indoor workplaces and are thus covered by the smoking provisions of the proposed standard. Like the restriction on smoking in the home, the "letter" of the proposed standard prohibits smoking in all vehicles that have at some time or another been used in the course of employment. Smoking would therefore be prohibited in such vehicles at all times, not just during company business.

Also, if an employee's car has been used in the course of employment, he would be prohibited from smoking in that vehicle even while alone. To prohibit an employee from smoking while alone in his own vehicle is patently unreasonable.

6. International airline flights

Under the proposed standard, employers could not require their employees to take international airline flights because smoking is permitted on those flights. In addition, flight attendants could not be required to enter those cabins where smoking had occurred in order to serve passengers.

7. Tobacco shops

The proposed standard contains no exclusion for those shops engaged primarily in the sale of tobacco and tobacco-related accessories. Patrons of such shops are accustomed to sampling the various tobacco blends and products while on the premises in order to determine the blend or product they prefer. The proposed standard would require the shops to build designated smoking areas, separate from the shops' work areas, and would prohibit the shops' employees from serving customers in those areas.

8. Scientific research facilities

The proposed smoking restriction contains no exclusion for smoking that is necessary to scientific research. Under the current proposal, smoking experiments could not be conducted in designated smoking areas because laboratory employees could not work in those areas.

9. Arts and entertainment

The provisions in the proposed standard that prohibit smoking of tobacco products in any work area make no exceptions for the arts and entertainment industries. Thus, the proposed standard, as currently drafted, would ban the use of tobacco products in any movie scene. Likewise, a live theatrical

production could not permit the smoking of tobacco products by any character in the production. Similarly, a model could not be employed to pose for a photograph with a cigarette as this activity would not (and could not) be limited to a non-work area as required by the proposed standard.

B. The proposed standard's smoking restrictions improperly interfere with "personal choice"

The regulation of indoor smoking presents unique legal, policy and practical issues. Many of these issues stem from the concept of governmental involvement in "personal choice" issues. In its proposal, OSHA seeks to address a perceived harm from nonsmoker exposure to ETS. The Agency has not chosen to address the issue of the smoker's exposure to his or her own smoke, either from the act of smoking itself, or from the exposure to the smoke from other smokers in a designated area. Presumably, this choice was made in recognition that these activities fall within the personal choice of the employee. If OSHA were to determine that the personal choice to smoke was an appropriate subject for government regulation, then OSHA could, under exactly the same theory, ban an employee's consumption of red meat, salt, coffee, sugar substitutes, butter, or fried chicken.

The Agency offers no rationale for this distinction, and it appears to be a pure policy choice. Its implications are

important, however, because once such a policy choice is made, the remainder of the regulation must be consistent with that policy.

It is apparently the Agency's intent to require employers to prohibit employees from working in a designated smoking area. The preamble states that "no work of any kind shall be performed in a designated smoking area when smoking is taking place" (59 FR 16029), and that "[n]o employee can be required to work in an area where there will be contamination from ETS" (59 FR 16001) [emphasis added]. This position is not consistent with the proposed regulatory text, however, which provides that cleaning and maintenance can be conducted in such areas as long as no smoking is taking place at that time (29 CFR § 1910.1033(e)(1)(iii)) and that employees are not required to enter designated smoking areas in the performance of normal work activities. (29 CFR § 1910.1033(e)(1)(iv))

This distinction between the preamble and the regulatory text is important because, based upon the language in the regulatory text that no employee can be "required" to enter a designated area, a smoker could, for example, choose to read a work-related memorandum while in a designated area. A smoker could also choose to enter the designated area to discuss a work-related matter with a smoking co-worker. The language in the preamble, however, would dictate that the work-related reading of the memorandum or the discussion with the co-worker would be

prohibited. This would place OSHA in the absurd position of not only ensuring that no person smoke while not in a designated area, but that no person perform any work while in a designated area.^{27/} The concept of OSHA issuing a citation to an employer for failing to ensure that no work was performed in a designated smoking area is mind-boggling.

Clearly, if the Agency incorporates provisions regarding indoor smoking in its final regulation, a common sense approach must be applied. As such, even under its proposed standard, the following situation would appear to be permissible, based upon the specific language of the proposed rule: If the employee desired, his or her private office could be a designated smoking area provided that no other employee was required to enter as part of normal work activities. This would not preclude any other employee from volunteering to enter the office/designated area, even though that employee might not be a smoker, as long as that other employee was not required to enter.

It would simply be illogical and unworkable to attempt to treat "smoking" employees and "nonsmoking" employees differently, because the difference in their status only occurs when the employee actually lights a cigarette or other tobacco product. In

^{27/}Interestingly, the Wage Hour Interpretive Bulletins, 29 CFR § 785.18, would require that employers compensate employees for this time in the designated smoking area, even though OSHA would prohibit any work from being performed.

fact, a "nonsmoking" employee can become a "smoking" employee, simply by declaring that he or she smokes. Accordingly, if a "smoking" employee can work in a designated area, so could a nonsmoking employee, if they chose to do so.

Given these clear practical problems with the application of the regulation as currently drafted, OSHA, if it determines that regulatory action is warranted at all, must look at other options. Two approaches deserve consideration. First, OSHA should consider a permissible exposure level for one or more of the constituents of ETS. This approach would address ETS exposure and could also be integrated with the agency's regulation of other indoor air constituents. For example, a permissible exposure level based upon carbon dioxide as a surrogate for both adequate ventilation and acceptable exposure levels of ETS would be consistent with OSHA's approach to every other airborne toxic substance OSHA has ever addressed. It would also not create an artificial differentiation between smoking and nonsmoking employees, because an employer would be required to ensure that no employee was exposed to levels of carbon dioxide over the PEL.

Another regulatory approach, which would recognize the problems inherent in the regulation of an issue involving personal choice, would be a regulation which simply prohibited an employer from requiring an employee to work in an area where smoking is currently taking place. This approach would be much easier to

enforce because the compliance officer would only have to determine whether an employee was required to work in an area at a time when anyone (employee or patron) was smoking. Either of these options would establish a much more workable regulatory scheme.

V. THE STANDARD IS UNCONSTITUTIONALLY VAGUE
AND UNENFORCEABLE

Civil statutes and regulations, like the proposed IAQ standard, are subject to judicial review for vagueness. (Village of Hoffman Estates v. Flipside, 455 U.S. 489 (1982)) In cases involving regulations that impose penalties for violations, such as OSHA standards, courts consider whether the law is sufficiently definite to provide notice of the conduct it prohibits or requires and to guide those that must apply it. Recently, the Eleventh Circuit in Georgia Pacific Corp. v. O.S.H.R.C., No. 93-6503 (11th Cir., July 13, 1994), held that the OSHA standard pertaining to the operation of forklifts was unconstitutionally void as applied. The standard provided: "If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing." (29 C.F.R. § 1910.178(n)(4)) During an enforcement proceeding, OSHA and the cited party suggested several interpretations of the words "obstructs forward view." In reviewing the standard for vagueness, the court asserted: "Like other statutes and regulations which allow monetary penalties against those who violate them, an occupational safety and health standard must give an employer fair warning of the conduct it prohibits or requires." (Id., citing Diamond Roofing v. O.S.H.R.C., 528 F.2d 645 (5th Cir. 1976)) Given the varying interpretations of the standard's requirements, the court found "that where the Secretary is unable to settle upon a single definition of a critical term or phrase of its own regulation, that

the regulation is unconstitutionally vague as applied for failing to give sufficient guidance to those who enforce OSHA penalties, to those subject to civil penalties, or to those courts who may be charged to interpret and apply the standards." (Georgia Pacific at LEXIS 18)

The proposed standard is ambiguous with respect to both the physical and temporal scope and application of its provisions. First, it is so vague with respect to the types of enclosed workplaces it covers that its adoption and enforcement by OSHA deprives interested parties of a reasonable opportunity to determine which of their facilities, operations, homes, vehicles, etc. are covered by the standard and to comply accordingly. For example, although the standard does not specifically mention that it covers private residences, its general coverage of indoor work areas implicitly includes homes where an employee works. Where a housekeeper, repair person, delivery person, home office worker, family member or any other employee performs work in a private residence, the "letter" of the standard would require the employer (i.e., the home owner or home service contractor) to restrict smoking in the home to a designated area meeting the costly specifications of the standard. In effect, this interpretation of the standard would prohibit home owners from smoking in their own homes. It also appears from the language of the standard that such home owners would be prohibited from smoking at any time, not just while an employee is working in the home.

Second, the proposed standard requires that "no smoking" signs be posted at every entrance to all enclosed workplaces covered by the standard. It appears that this requirement applies to every home nationwide, almost all of which at some time or another have employed someone, and to every vehicle used in the course of employment. The standard is unclear regarding whether it requires the posting of such signs continually, or only when a employee is working in the home or using the vehicle in the course of employment.

Finally, the standard is so vague in scope and application that it fails to provide legally fixed standards and adequate guidelines for OSHA, the courts, and others whose obligation it is to enforce, apply and administer the standard.

The lack of legally fixed enforcement standards renders enforcement impossible. Potentially, the proposed standard would regulate smoking in homes and businesses nationwide. As it stands, OSHA has difficulty monitoring existing workplaces for compliance with current standards. The enforcement of a standard as broad and vague as the proposed IAQ standard would require a virtual police state.

Thus, the proposed standard is vague to the point of unenforceability. Adoption and enforcement of such a vague

standard would deprive employers of their due process rights in violation of the Fifth Amendment of the United States Constitution.

VI. THE STANDARD IS UNCONSTITUTIONALLY OVERBROAD

A law that properly regulates certain activity but also infringes upon constitutionally protected rights is unconstitutionally overbroad. (Village of Hoffman Estates v. Flipside, 455 U.S. 489 (1982)) Application of the proposed standard to homes, sleeping rooms in hotels and motels, and private vehicles unnecessarily and unreasonably infringes upon the federal constitutional right to privacy that arises as a "penumbra" of the First, Fourth, Fifth, Ninth and Fourteenth Amendments to the United States Constitution.

In Stanley v. Georgia, 394 U.S. 557 (1969), the U.S. Supreme Court recognized a zone of privacy in one's home. From the First, Fourth, Fifth, Ninth, and Fourteenth Amendments ascends a penumbra of rights creating a constitutionally protected expectation of privacy in one's home. (Id. at 564-65) The Court held, "The right to be free except in limited circumstances from unwanted governmental intrusions into one's privacy is fundamental." (Id. at 566)

The Supreme Court has a long history of affording constitutional protection to activities conducted within the confines of the home. The Fourth and Fifth Amendments run a parallel course as protection against government invasions "of the sanctity of a man's home and the privacy of his life." Boyd v.

United States, 116 U.S. 616, 630 (1986) (Court stated that the "essence of a Fourth Amendment violation is not the breaking of a person's doors, and the rummaging of his drawers, but rather is the infeasible right of personal security, liberty and private property"); see also, Griswold v. Connecticut, 381 U.S. 479, 485 (1965) (Court noted that intrusion into one's home to enforce an anti-contraception statute is constitutionally intolerable); Stanley v. Georgia, supra (Court stated that the First and Fourteenth Amendments protect possession of obscene materials in a private home); Payton v. New York, 445 U.S. 573, 603 (1980) (Court overturned conviction that resulted from warrantless and non-consensual entry into the defendant's home to effect arrest). Moreover, government intrusion into a person's private home either physically or by regulation merits some constitutional protection. See, Moore v. City of East Cleveland, 431 U.S. 494, 500 (1977) (Court held that a local ordinance that restricted living arrangements within private homes unconstitutional). Even actions that are clearly not protected constitutionally, such as publicly showing obscene films to consenting adults, Paris Adult Theaters I v. Slaton, 713 U.S. 49, 66 (1973), are given a heightened level of protection under the federal Constitution when done in the privacy of one's own home. Stanley v. Georgia, supra, (finding that although there is no per se protection for possession of obscene material, possession within the home receives constitutional protection); see also, Katz v. United States, 389 U.S. 347, 361 (1967) (Court stated that the expectation of privacy in one's own

home is high and activities conducted in the privacy of home deserve more constitutional protection than activities and statements exposed to the public. These cases indicate that specific activities, like smoking, while not amounting to fundamental rights, may still receive constitutional protection when conducted in the home and thereby demand increased scrutiny.

In addition to infringing upon employers' right to privacy, the proposed standard also unnecessarily and unreasonably infringes upon their right to freedom of speech, in violation of the First Amendment to the United States Constitution.

As explained above, the standard's broad application may require the posting of "no smoking" signs at every entrance to nearly every home nationwide and on the doors of every vehicle used in the course of employment. The standard also could be interpreted to require the posting of such signs continually, not just when an employee is working in the home or using the vehicle in the course of employment. Aside from the proposed rule's unreasonable and unnecessary scope, requiring "no smoking" signs to be posted year-round on private residences and private vehicles, just because those areas are at times a workplace, is unconstitutional forced speech.

The United States Supreme Court has held on numerous occasions that forced speech (e.g., government mandated posting of

signs) violates the First Amendment of the Constitution. Wooley v. Maynard, 430 U.S. 705 (1977); see also, Pacific Gas & Electric v. Public Utilities Commission of California, 475 U.S. 1 (1986); Harper & Row Publishers, Inc. v. Nation Enterprises, 471 U.S. 524 (1985); Miami Herald Publishing Co. v. Tornillo, 418 U.S. 241 (1974).

Because the proposed standard unreasonably and unnecessarily infringes upon employers' right to privacy and freedom of speech, it is unconstitutionally overbroad.^{28/}

^{28/}The constitutional nature of the rights the Standard infringes upon also calls for stricter scrutiny for vagueness. Village of Hoffman Estates, 455 U.S. at 499.

3

2050239843

SECTION III
WORKPLACE IAQ AND SIGNIFICANT RISK:
OSHA'S PROPOSED RULE
AND
SEPARATE RULEMAKING FOR ETS

2050239844

WORKPLACE IAQ AND SIGNIFICANT RISK:
OSHA'S PROPOSED RULE
AND
SEPARATE RULEMAKING FOR ETS

OSHA'S PROPOSED RULE ON IAQ RECOGNIZES THE IMPORTANCE OF THE PROPER DESIGN, MAINTENANCE, AND OPERATION OF A BUILDING'S HEATING, VENTILATION AND AIR CONDITIONING (HVAC) SYSTEM; THE PROPOSED RULE, HOWEVER, FALLS SHORT OF PROVIDING A COMPREHENSIVE APPROACH TO WORKPLACE IAQ; OSHA FAILS TO ADEQUATELY SUPPORT ITS OWN PROPOSED RULE AND FAILS TO DEMONSTRATE A SIGNIFICANT RISK OF MATERIAL IMPAIRMENT FROM IAQ

OSHA's Proposed Rule on indoor air quality (59 FR 15968) is based upon the following contentions:

(1) Indoor air quality problems are most often associated with inadequate ventilation system performance. The Proposed Rule states: "A common theme that runs through the literature and the OSHA docket indicates that the principal factor associated with indoor air quality complaints is inadequate ventilation" (59 FR 16010);

(2) Complaints regarding unacceptable indoor air quality (usually associated with symptoms of irritation, annoyance and discomfort) cannot, as a rule, be traced directly to specific airborne substances or to specific levels of exposure. The Proposed Rule states: "air quality complaints usually have some basis, although they are often difficult to assess with

specificity . . . [complaints] are not easily traced to a specific substance, but are perceived as resulting from some unidentified contaminant or combination of contaminants" (59 FR 15970); and

(3) Remediation and mitigation of poor indoor air quality, and the attainment and maintenance of acceptable indoor air quality, depend upon the correct design, operation and maintenance of a buildings' ventilation system. The Proposed Rule states: (a) "Symptoms . . . may be reduced or eliminated by modifying the ventilation system" (59 FR 15970); (b) "The outside air ventilation rate of the building affects indoor air quality. It determines the extent to which contaminants are diluted and removed from the indoor environment" (59 FR 16003); (c) Sick-building investigations report "the lack of outside ventilation air resulting from operational or maintenance deficiencies as one of the causes of IAQ complaints. Many of the studies include abatement recommendations to ventilate with outside air as feasible per the original design intent . . . [R]esearch projects . . . also support the case for ventilating buildings with at least the recommended minimum of outside air." (59 FR 16027)

Inadequate ventilation is associated with
approximately one-half of all complaints in
sick-building investigations

A number of summaries and databases of "sick-building" investigations were submitted to the docket on OSHA's 1991 Request for Information on Indoor Air Quality (RFI). With one exception, the Proposed Rule fails to reference or discuss any of them. One of the most notable compilations of sick-building investigations was undertaken by NIOSH, referenced in the OSHA Proposed Rule at 59 FR 16003 and 16010. Inadequate ventilation was identified as a primary problem in fifty-two percent (52%) of the 484 building investigations in the NIOSH database.^{1,2} Inside contamination was identifiable in only fifteen percent (15%) of all buildings; microbiological contaminants were identified in five percent (5%).

Other building investigation databases that were neither referenced nor discussed in the Proposed Rule report similar results. For example, a database of 1,362 building investigations has been compiled by Health and Welfare Canada.^{3,4} Inadequate ventilation was identified as the primary problem in fifty-two percent (52%) of the buildings investigated. Specific indoor air contaminants were identified in only twelve percent (12%) of the investigations. (Exs. 3-1073, 3-1074)

Public Works Canada, another Canadian federal agency, investigated 30 buildings for IAQ complaints between 1987 and 1990.⁵ Ventilation-related problems were reported in one-half of the buildings. (Ex. 3-1073)

TDSA Ltd. have compiled data on 408 building investigations conducted in the U.S. and Canada. (Ex. 3-1073) The results have been analyzed and computerized in what is called the "Building Performance Database." Ventilation-related inadequacies were directly associated with IAQ complaints in forty-nine percent of the buildings catalogued in the Database.⁶

A private, U.S.-based IAQ monitoring firm conducted 412 building investigations from 1981 through 1988. (Ex. 3-1053) Ventilation problems were associated with complaints in sixty-two percent of the buildings investigated; bacterial and fungal contamination was reported in nearly a third of all buildings investigated.

A 1989 report by Dr. James Woods assessed 30 cases of "problem buildings" investigated by the Honeywell Corporation since 1986. Woods' research indicates that 75 percent of the buildings investigated had inadequate outdoor supply air intake. Similarly, 75 percent of the buildings exhibited inadequate air distribution.

to occupied spaces, and 65 percent of the buildings suffered from inadequate HVAC maintenance.⁷ (Exs. 3-745, 3-1074)

Kim (1990) summarized 105 investigations of problem buildings undertaken by Clayton Environmental Consultants, an IAQ monitoring firm in the U.S.⁸ (Ex. 3-505), and wrote:

In a survey of 105 buildings, Clayton found that 53 percent had [HVAC] maintenance problems, 49 percent had operational problems (such as improper handling of control equipment), and 33 percent had design problems. Mechanical engineers evaluated the HVAC systems in 70 of the buildings, in which they found that 75 percent had maintenance problems, 70 percent had operational problems, and 47 percent had design problems. Of the 105 buildings, 95 were sampled for contaminants. Of these, 28 were found to have problem levels of microbial contaminants, 26 had volatile organic compounds and 13 combustion products. (Ex. 3-1074)

Freund, et al., from the New Jersey Department of Health, evaluated 221 complaint buildings in that state and reported that 43 percent were associated with inadequate ventilation.⁹ (Ex. 3-1053)

The Oregon Department of Resources submitted results of 36 state office building investigations to the OSHA RFI docket. (Ex. 3-1157) The respondents observed:

Thirty-six state office buildings were examined for IAQ problems. Significant

problems were found in 16 buildings. Many of the problems were associated with inadequate ventilation and high levels of carbon dioxide . . . [S]tudies in Oregon have shown that when outside make-up air falls below 15 cfm, complaints increase.

In a submission to OSHA by the Local 12/Occupational Illness Support Group of the U.S. Department of Labor, the authors report that:

Inadequate ventilation is the primary cause of most of the indoor air quality problems . . . This is a result of the Department's inability to maintain adequate amounts of outside air. (Ex. 3-1017)

Thus, published data from a number of building investigation databases submitted to OSHA reveal that deficiencies in ventilation have been directly related to IAQ complaints in approximately one-half or more of all reported cases. HVAC-related problems have been associated with complaints in as many as 75 percent of the sick-building investigations discussed above.

IAQ complaints generally cannot be associated with specific substances

Although the Proposed Rule correctly contends that correlations between specific complaints and specific substance exposures in indoor air quality investigations are rare, it fails to cite relevant support from materials submitted to OSHA in the RFI docket. (59 FR 15969) A number of comments submitted to the

docket substantiate that claim. For example, the Atlantic Richfield Company (ARCO) reports that, in their experience, "when monitoring has been conducted, hazardous contaminants have either not been detected, or they are present in concentrations far below those known to present health hazards." (Ex. 3-448)

The submission from Organization Resources Counselors states that:

Companies report monitoring for formaldehyde, total and respirable particulates, total organics. . . . In almost all cases where monitoring was done for specific contaminants, results were either below the level of detection, or were below OSHA Permissible Exposure Limits. (Ex. 3-1084)

Similarly, CanTox, Inc. reports that:

More than half (63 percent) of the compounds detected in indoor air could not be attributed to a definite source. The largest group with known sources were found to have multiple sources and their presence could not be exclusively attributed to one specific source. This clearly has significant implications with respect to attempting to use source control to maintain indoor air quality. (Ex. 3-1180)

The American Federation of Government Employees (AFGE) of the AFL-CIO reports that "unfortunately, despite the substantial evidence linking poor indoor air quality to AFGE members' adverse health effects, AFGE is unable to obtain the data needed to make

the causal connection between specific contaminants and those adverse health effects." (Ex. 3-529)

United Technologies reports that, "based on our experience in occupational settings and knowledge of the professional literature, there are only very weak data that directly relate specific chemicals to IAQ." (Ex. 3-651)

TDSA Ltd., after citing four studies, reports that:

The correlation between symptoms presented in IAQ complaints and causative agents is weak because exposure to many different types of contaminants in indoor air, originating from both indoor and outdoor sources, has been shown to result in similar health and comfort complaints. The presence of pollutants in indoor air, combined with thermal comfort parameters of temperature and humidity, and other building characteristics, such as ventilation, lighting, noise and occupant density and activities, make it difficult to isolate the causative agent in IAQ-related health and comfort complaints. (Ex. 3-1073)

The American Industrial Hygiene Association (AIHA) notes that, based on their experience:

In most IAQ complaints, symptoms are non-specific and could be caused by a variety of factors. Correlations can be found where there is a consistent spacial and temporal relationship and the complaint can be resolved by changing the building condition. Biological contamination may sometimes be distinguished by a pattern of allergy symptoms. (Ex. 3-735)

The Building Performance Database compiled by TDSA Ltd. provides data on airborne substance monitoring from over 200 sick-building investigations. Average recorded levels of carbon dioxide, carbon monoxide, respirable suspended particles, formaldehyde, airborne fungi and bacteria, nicotine, temperature and humidity are all within parameters of "acceptable" exposure. Nevertheless, the buildings from which the monitoring results arose were deemed "sick." The authors conclude: "In general, IAQ investigations of white collar workplaces have found indoor concentrations of measured substances far below occupational exposure levels." (Ex. 3-1073)

The sick-building databases submitted to the OSHA RFI Docket indicate that ETS is associated with complaints in only two to five percent of all investigations; the data do not support OSHA's attempt to separate ETS from general IAQ issues

OSHA's Proposed Rule conspicuously omits any discussion of ETS within the context of its discussion on IAQ and the identification of specific causes in sick-building investigations. The major databases on sick-building syndrome submitted to the OSHA RFI docket indicate that tobacco smoke is rarely the underlying cause of complaints about poor indoor air quality.^{1,3,6} For example, in HBI's database of 412 sick-buildings, ETS was reported to be a significant contributor to complaints in only 3 percent of all

buildings investigated. (Ex. 3-1053) In the sick-building database compiled by TDSA Ltd., smoking was implicated as a major contributor to complaints in only 12 of 408 (less than 3 percent) of the buildings surveyed.⁶ (Ex. 3-1073) NIOSH investigated more than 200 sick-buildings through 1984 and reported that tobacco smoke was a source of claimed discomfort in only 2 percent of the buildings investigated.¹ (Ex. 3-1074) In a summary of 94 building studies by government investigators from Health and Welfare Canada, complaints were attributable to indoor constituents such as photocopy machine emissions and ETS in only 5 percent of the buildings investigated.³ (Ex. 3-1074)

Professor Alan Hedge of Columbia University submitted the results of his study on 4,479 office workers from 27 air-conditioned offices to the RFI docket. (Ex. 3-955) Hedge examined the potential impact of smoking and smoking policies on reports of sick-building syndrome. He reported that sick-building complaints could not be correlated with levels of ETS constituents in the indoor air, and that workers in smoking-prohibited buildings, on average, reported more symptoms than workers in buildings with restricted smoking policies.

One submission to the OSHA docket thus concluded:
"Removing the smoker entirely, then, would not affect health and

comfort problems in 95 to 98 percent of sick-buildings." (Ex. 3-1073)

Ventilation: the mitigation procedure for
poor IAQ

The data on ETS discussed above are derived from the same databases that support OSHA's contention regarding the primary cause of complaints about indoor air quality, namely, inadequate ventilation. The Proposed Rule correctly recognizes that the appropriate mitigation procedure for complaints focuses on ventilation, and, specifically, on adequate supply air, its distribution to occupied spaces, and the proper maintenance of HVAC systems. The RFI docket is replete with such recommendations. For example, the New York State Building and Construction Trades Council reports that, based on their experience, "the average office setting exposes workers to contaminants from machines, carpets, paints, glues, and fungi. These contaminants mix with the air the workers breathe on a daily basis and affect a person's well-being. Proper ventilation has been shown to provide a proven antidote to these problems." (Ex. 3-732)

IAQ investigators from AFSCME Local 12 from the University of Iowa Employees Union report that "we have found that insufficient fresh air flow is most often the cause of a number of

symptoms, including coughing, skin and eye irritations, headaches and upper respiratory infections . . . [I]ndoor air quality problems can be treated with little effort and expense by improving or upgrading inadequate ventilation systems to increase fresh air flow in the workplace." (Ex. 3-1171)

Investigators from CanTox Inc. agree: "[C]ontrol of the air exchange rate (i.e., ventilation) of a building is probably the most important and practical mediation practice for management of indoor air quality." (Ex. 3-1180)

The State of New Jersey Health Department's investigation of 221 complaint buildings revealed that over 43 percent of all cases involved inadequate ventilation.⁹ In cases where abatement recommendations were made, the recommended strategy consisted of increased maintenance, repair, adjustment or redesign of the HVAC system. Eighty-four percent of the cases where such abatement steps were implemented reported the elimination of complaints. (Ex. 3-1053)

Indoor air quality in schools has recently become an issue of considerable concern. In 1989, Helsing and co-workers reported the results of an IAQ investigation in a school.¹⁰ They reported that "there was an insufficient fresh air supply to some classrooms and a large percentage of students exhibited classic

symptoms of sick-building syndrome, i.e., headache, eye burning, fatigue." Similarly, investigations by Hanssen (1987)¹¹ and Beller (1989)¹² reported that low air exchange rates in combination with installation of new building materials were the main cause of complaints in the schools that they investigated. Helsing, et al. concluded: "Correcting the ventilation problems resulted in reduction of symptoms to a level approximately equal to that of students in other schools in the county."¹⁰ (Ex. 3-1074)

In 1989, Collett and Sterling examined the effect of ventilation retrofits on perceived health and comfort complaints by building occupants. For the buildings in which major retrofits were undertaken, perceptions of indoor air quality improved in seven of nine categories surveyed. (Ex. 3-1073)

Similarly, health officials who investigated and compiled the Canadian sick-building database (Health and Welfare Canada) observed that recommendations for improvements in ventilation and thermal comfort had been made in 60 percent of the 1,400 buildings investigated, while control of specific pollutants was recommended in only 20 percent of all cases.¹³ (Ex. 3-1074)

In 1984, a committee on sick-building syndrome from the WHO's Europe Working Group on Indoor Air Research concluded that an increase in outdoor air supply rates, together with improvements in

air distribution, had satisfactory results in remediating sick-building syndrome. (Ex. 3-188)

The Ohio Civil Service Employees Association, after reviewing three indoor air quality incidents in Ohio, endorsed the ventilation approach "as a vital component in solving and preventing persistent health and safety problems related to indoor air in the workplace." (Ex. 3-398)

Steven B. Hayward of the State of California Department of Health Services recommends adoption of a minimum ventilation standard similar to that currently in effect as a Cal/OSHA regulation. The Cal/OSHA standard requires that a minimum supply of outdoor air specified in the State Building Standard Code be provided (15 cfm/m³), and that the HVAC system be operated continuously, inspected regularly, and properly maintained. (Ex. 3-17)

Respondents to the RFI also observe that adequate ventilation is the preferred method for controlling exposures to radon, VOCs, CO, CO₂, bioaerosols and ETS. (Exs. 3-500, 3-61, 3-1053) Indeed, the U.S. Department of Labor's own Occupational Illness Support Group states that ETS and radon "have seldom been the source of employee complaints of poor indoor air quality. With properly designed and properly operated ventilation systems,

exposure to radon and passive smoke can be minimized." (Ex. 3-1017)

OSHA's Proposed Rule fails to address other environmental variables unrelated to IAQ that play a role in worker complaints about health and comfort

The Proposed Rule dismisses the possibility that factors unrelated to IAQ, e.g., temperature, lighting, stress, workload, etc., may play a role in worker perception about IAQ. OSHA discounts the potential psychological element in worker complaints by arguing that complaints "are unlikely to be due to mass psychogenic illness." (59 FR 15970) OSHA misses the point. A number of studies in the published literature that were submitted to the RFI docket indicate that lighting, temperature, humidity, job satisfaction, job stress and ergonomics are factors that influence worker perceptions about IAQ. (Ex. 3-1073) For example, in a SBS study in Denmark, Skov and colleagues examined sick-building syndrome reports among 4,369 office workers.¹⁴ Their research indicated that indoor climate perception was strongly related to the prevalence of SBS symptoms. Lifestyle factors were only weakly associated with the reporting of symptoms. (Ex. 3-1074)

A 1991 report by Hawkins and Wang ranked a number of variables related to self-reported symptoms of sick-building syndrome.¹⁵ Those variables included: "humidity," "satisfaction

with work," "active smoking," "gender," "exposure to ETS," "office light," and "doing professional work." They concluded:

Building Sickness Score was associated with many factors. Sick building syndrome symptoms are influenced by multiple variables of which the environmental factor of humidity and the psychological factors of work, sex, and occupation are important. (Ex. 3-1074)

Based on one of his own studies, Hedge reports that although ventilation has an important effect on indoor air quality, reports from workers in 46 office buildings in the United Kingdom indicate that complaints are even more strongly influenced by a number of personal and occupational factors such as gender, job stress, job satisfaction and computer use. (Ex. 3-955)

The American Industrial Hygiene Association (AIHA) reports that "psychosocial and physical stresses are certainly potential causes of some IAQ complaints and should always be considered in any investigation." This opinion is based on the experience of AIHA members. (Ex. 3-735)

Citing two studies, Eagle Environmental Health reports that "thermal discomfort, unpleasant odors, lack of air movement, insufficient lighting, and excessive noise are also indicated in IAQ investigations. Job-related stress many also manifest itself in IAQ complaints." (Ex. 3-500)

The National Energy Management Institute (NEMI) reports:

The NEMI experience has revealed that there are a variety of factors which can interact to cause a worker to display indoor environmental health-related problems. These factors may actually be the primary cause or may exacerbate an IAQ problem condition. Temperature, temperature change, humidity, air velocity, light levels, noise as well as psycho-social factors should always be considered in presenting and investigating IAQ problems. (Ex. 3-1183)

Even the U.S. EPA recognizes that factors related to SBS are multi-factorial, involving combined environmental and psycho-social stressors. (Ex. 3-1075, Attachment H) Citing the World Health Organization (1986), the EPA notes:

Buildings at highest risk [of SBS] appear to be new or recently remodeled buildings with tight envelopes, especially those with large ventilation systems that depend on limited fresh air sources. Improper ventilation, thermal conditions, and occupant lack of control over climatic and working conditions are other factors that may increase the likelihood of a building being linked to sick-building syndrome. (Ex. 3-1075, Attachment E)

A NIOSH psychologist, Dr. Michael Colligan, has offered an explanation for the role of such factors in perceptions about IAQ.¹⁶ (Ex. 3-1074) He writes:

It appears then, that the individual is sensitive to fluctuations in the functioning of the autonomic nervous system. When perceived changes in his subjective state are understandable, e.g., 'I have an allergy,'

'I've been under a lot of pressure to met a deadline,' 'I'm worried about my teenager,' an individual can initiate various coping strategies to deal with the causes. When the origins of the experienced distress are vague or unclear, however, an individual starts searching around for salient cues. If the environment provides a plausible cause in the form of a pungent odor or dense, stuffy air, then an individual can conclude, rightly or wrongly, that the poor quality of the environment is responsible for his physical and psychological discomfort. Notice that this process can occur independently of any specific toxic effects the environment might have on the individual and irrespective of the 'real' cause of the autonomic arousal. All that is required is that individual experience autonomic arousal in response to a subtle or unidentified stressor or combination of stressors. Cues provided by the environment in the form of noxious odors, visually detectable particulates or dust, or humid, stuffy air, may suggest to an individual that his discomfort is a toxic response to an airborne pollutant. That environment then becomes a source of threat to the individual, which in turn may generate more autonomic arousal and anxiety.

Dr. Colligan's observations provide an understanding of complaints related to ETS in the workplace. Because it is readily identifiable, ETS is often initially blamed for IAQ problems (yet after investigation, reported exposures to ETS are directly associated with complaints in only two to five percent (2-5%) of sick-buildings).¹⁻⁴ If individuals are "stressed" by their work environment (influenced by such diverse factors as temperature, humidity, air movement, ergonomics, workload, personal problems, etc.), the mere visibility of ETS may provide a cue for a

complaint. Recent research by Winneke and colleagues indicates that an individual with a dislike of ETS will more readily, under actual exposure conditions, respond with annoyance symptoms.¹⁷ (Ex. 3-1074) Researchers from the Illinois Institute of Technology also addressed the issue of nonsmoker perception of annoyance and irritation from ETS exposures. The study, involving over 250 subjects, reported that visual contact with a smoker increased the magnitude of adverse response to ETS among selected nonsmokers. The authors suggest that their conclusion "provides an inexpensive strategy of reducing complaints associated with ETS: eliminate visual contact between smokers and nonsmokers." (Ex. 3-31)

Precise quantitation of psychological variables and perceptions of comfort within the context of complaints about IAQ is extremely difficult. Nevertheless, the influence of those environmental variables upon IAQ complaints must be recognized and considered in a comprehensive approach to IAQ.

OSHA's Proposed Rule does not establish a significant risk of material impairment from IAQ problems in the nonindustrial workplace; data are available to establish significant risk from SBS and BRI in the workplace, but the Proposed Rule does not reference or document representative examples

Despite a number of submissions to the OSHA RFI docket on IAQ that document specific examples and studies on sick-building syndrome (SBS) and building-related illness (BRI) (e.g., Exs. 3-

500, 3-933, 3-955, 3-1053, 3-1054, 3-1073, 3-1074, 3-1183, 3-1185), the Proposed Rule provides only a cursory examination of the available data. (59 FR 15970-73). Specific case reports document hundreds of instances of BRI and SBS that often result in occupant deaths or debilitating illnesses. A sample of those buildings is summarized in Table I. The 287 specific cases of SBS/BRI were not in any way associated with ETS; in many of the buildings, smoking was prohibited altogether.

Studies and reports of SBS and BRI document thousands of cases of specific diseases and illnesses, yet OSHA only acknowledges the possibility of such instances and chooses, instead, to provide a theoretical, quantitative model that estimates the risk of headaches and upper respiratory symptoms from poor IAQ. (59 FR 15997) The model does not include instances of death and serious illness due to poor IAQ. OSHA's model projects potential cases of dry eyes, stuffy nose and headache, but it does not satisfactorily demonstrate a significant risk of material impairment from IAQ. Specific instances of mortality and morbidity due to poor IAQ in the nonindustrial workplace, on the other hand, are available (and were made available to OSHA in submissions to the RFI docket on IAQ). OSHA has not presented the "best available evidence" to support its own position on IAQ.

BUILDINGS THAT ARE REPORTEDLY SICK

<u>No.</u>	<u>State</u>	<u>City</u>	<u>Diagnosis</u>	<u>Date</u>	<u>Building</u>	<u>Comment</u>
1.	AL	Enterprise	SBS	1991	Coffee County Department of Human Resources	Allergic responses from nearly all 37 employees; building still causing health problems
2.	AK	Anchorage	SBS	1990	State Office Building (<u>Henley v. Blomfeld Co.</u>)	Carpet/HVAC; case settled
3.	AK		BRI	1992	Indoor skating rink	Freon leak and inadequate ventilation; one death, 33 injuries
4.	AZ	Globe	SBS	1993	Gila County Sheriff's Building	15 people hospitalized; suspect air-conditioning system drawing in bacteria from old carpeting
5.	AZ	Phoenix	SBS	1993	Corporation Commission	
6.	AZ	Phoenix	SBS	1990	Department of Economic Security	Unusual odor; 10-15 people experience burning eyes, sore throats, rashes, lethargy; chemical used in microfilm duplication machine is suspect; plan to clean air conditioning duct work
7.	AZ	Tucson	SBS	1988	Amelia Maldonado Elementary School	Sewer gases; carbon dioxide, chlorine, pollens, spores, other allergens; school eventually closed
8.	CA	Anaheim	SBS	1990	Pacific Volt	
9.	CA	Anaheim	Legion	1992	Western Medical Center	Emergency room staff members have disease; testing underway
10.	CA	Beverly Hills	SBS	1992	The Beverly Plaza Hotel	Formaldehyde; other chemicals
11.	CA	Burbank	SBS	1989	Lockheed Corp.	440 OSHA violations; 88 suing
12.	CA	Chino	SBS	1990	California Institution for Men	Workers Comp Claims; 50% of employees affected; cause unknown
13.	CA	Duarte	Legion	1986	City of Hope Medical Center	Cooling System
14.	CA	El Segundo	SBS	1985	El Segundo Airport Towers, Building C (<u>Call v. Prudential</u>)	Renovation; poor ventilation; case settled during trial
15.	CA	El Segundo	SBS	1991	Phoenix Computer Corporation	General allergic reactions from new carpets, furniture and paint; HVAC system leaked; 40 employees settled
16.	CA	Goleta	SBS	1988	Raytheon Co. (<u>Buckley</u>)	Synthetics, carpet glue, plastic partitions; settled for \$625,000
17.	CA	Hayward	BRI	1982	Helen Turner Child Care Center	Chemicals from new roof; plaintiffs won class action suit against school, contractor and chemical manufacturer

5986EZ0202

18.	CA	Jackson	SBS	1991	Amador County Courthouse, District Attorneys Office	Possible ventilation problem; building newly renovated
19.	CA	Los Angeles	Legion	1988	UCLA Medical Center	8 infected; hot water system
20.	CA	Los Angeles	Legion	1988	Westwood Horizons residential facility	4 deaths; air conditioning unit
21.	CA	Los Angeles	SBS	1992	Pierce College library	Dirty ventilation ducts; HVAC hadn't been cleaned for 35 years; found dead animals, among other things, in ducts
22.	CA	Oakland	SBS	1991	Merritt-Peralta Medical Center	Test results pending; employees report hair loss
23.	CA	Oakland	BRI	1991	Alameda County Court House	Earthquake repairs; chemical fumes
24.	CA	Poway	SBS	1988	Midland Elementary School	Mold; general unsanitary conditions; students with allergies; tests inconclusive
25.	CA	Richmond	Legion	1990	Social Security Administration	Basement sink, 2 of 5 cooling towers; 3 lawsuits filed
26.	CA	Richmond	Legion	1991	Richmond Health Center	Test results pending
27.	CA	Riverside	SBS	1992	Riverside County Courthouse	Recently renovated; 15 ill
28.	CA	Sacramento	SBS	1982	Bateson Building (State Office Building)	Off-gassing from carpets and furnishings; building opened in 1981
29.	CA	Sacramento	SBS, Legion	1991	Twin Towers -- State Office Buildings CA Depts. of Health Services & Social Services	Leaks in buildings; dirty vents; poor ventilation; employee testified before Congress on IAQ; still being reported in 1993 respiratory problems and chronic fatigue 17 cases confirmed; CDC was asked to investigate; changes to ventilation system
						Study completed by CDC in 1994; over 600 reported fatigue; recommendations will come later
30.	CA	San Diego	SBS	1990	San Diego County Courthouse	Deaths and mysterious illness; asbestos cleared as cause
31.	CA	San Diego	SBS	1990	<u>(Henchey v. Income Property Group Office Park Building, et al.)</u>	Ventilation; suit settled for \$65,000
32.	CA	San Diego	SBS	1984	Palomar College Library	Complaints of headaches, respiratory problems and concentration problems; plans to remove and replace current heating and ventilation system
33.	CA	San Francisco	Legion	1992	University of California Medical Center	Water contaminated; one death
34.	CA	San Francisco	BRI	1992	Langley Porter Psychiatric Institute (University of California at San Francisco)	Poorly designed ventilation system drawing fumes from parking lot

99868Z050Z

35.	CA	San Francisco	SBS	1988	Bancroft-Whitney Co.	Over 900 employee complaints
36.	CA	San Francisco	SBS	1993	University-San Francisco Mission Center Building	General malaise, eye, nose and throat irritation; diisocyanate from an adjacent automobile body and paint shop; replace main air filtration system; cost for ventilation improvement - \$500,000
37.	CA	San Pedro	SBS	1992	Banning High School	Fumes from nearby refinery entering school through ventilation system
38.	CA	Stanford	Legion	1983	Stanford University Medical Center	7 infected; incidents occurred separately following heart surgery
39.	CA	Sunnyvale	Legion	1990	Lockheed Missile and Space Co.	Two buildings closed
40.	CA	Westminster	TB	1993	LaQuinta High School	Outbreak of drug-resistant T.B. 292 students tested positive in 1993; 84 additional cases in 1994; CDC said faulty ventilation contributed to outbreak; HVAC has been repaired
41.	CA	Westwood	Legion	1977	Wadsworth Veterans Administration Medical Center	201 cases reported between 1977 and 1981; bacteria traced to drinking water supply
42.	CA		SBS	1983	<u>Miller v. Lakeside Village Condominium Association</u>	Tenant experienced allergies from mold infested apartment; case dismissed based on statute of limitations
43.	CO		SBS	1992	District Attorneys Office, 16 Jud. Dist. (<u>Avery-Jorganson v. District Attorney</u>)	
44.	CO		SBS, Radon	1990	(<u>Brafford v. Susquehanna Corp.</u>)	Risk of future cancer
45.	CO	Castle Rock	SBS	1991	Douglas County School District Administrative Offices	19 employee complaints
46.	CO	Denver	Legion	1992	St. Anthony Hospital Central	3 dead, 2 others infected; traced to hot water tank
47.	CO	Denver	SBS	1989	Federal Building	Numerous illnesses; health survey conducted
48.	CO	Ft. Collins	SBS	1992	Colorado State University	115 employee complaints of symptoms; cause is under investigation
49.	CO	Lamar	Legion	1989	Best Western Cow Palace	18 ill, three dead
50.	CO	Rocky Flats	BRI	1991	Rocky Flats Nuclear Weapons Plant (U.S. Department of Energy)	Plutonium in ventilation system; building closed
51.	CO	Westminster	SBS	1990	City Pool	Ventilation system; lifeguards suffering from hypersensitivity pneumonitis; contractors are being sued; 82 workers' comp claims filed
52.	CT	Bristol	BRI	1984	Police - Court Complex	Mold in ducts; employees experiencing SBS

						symptoms; experts suggested cleaning and rebalancing ventilation system and monitoring cleaning materials
53.	CT	Hartford	SBS	1992	Bulkeley High School	Students exhibit classic sick building syndrome symptoms
54.	CT	Hartford	SBS	1991	One Myrtle Street (<u>Padgett v. Capital West Associates, et al.</u>) (Potential class action)	Bad ventilation, general uncleanliness, 40 plaintiffs reportedly asking for \$1 million each
55.	CT	Hartford	SBS	1991	U.S. Post Office (<u>Mendenhall, et al. v. Kerin; Clarkin v. Kerin</u>) (potential class action)	Eye and lung problems
56.	CT	Middletown	Legion	1993	Connecticut Valley Hospital	Source of infection still unknown; examination and cleaning of air-conditioning system as a precaution; attempt to determine whether 4 other cases of pneumonia are related to same problem
57.	CT	New Britain	SBS	1984	New Britain High School	Expert recommended upgrading ventilation system
58.	CT	New Haven	Legion	1986	Hospital of St. Raphael	Hot water pipes
59.	CT	New Haven	BRI	1985	Yale Medical School, Dept. of Epidemiology and Public Health	New carpet glue
60.	CT	Stamford	SBS, Legion	1990	West Main Street Shelter	Inadequate ventilation; moisture in walls; rat and bug infestation; building to be demolished
61.	CT	Stratford	Legion	1994	Stratford Group Home for the Retarded - Grasso Center	4 residents, 1 employee diagnosed with pneumonia; 1 of the 5 has been diagnosed with Legionnaire's disease; sources of water being checked
62.	CT		SBS	1991	Connecticut insurance company	Class action suit alleging that building conditions adversely affected its employees' health
63.	DC		SBS	1990	EEOC Headquarters	Fungus in ventilation; building to be gutted
64.	DC		SBS	1989	U.S. Dept. of Interior (<u>Perkins v. Maitico Operating Co.</u>)	Excessive heat, humidity and bacteria; case settled
65.	DC		BRI	1988	U.S. Information Agency	Lead in water
66.	DC		SBS	1986	General Services Administration Building	Mysterious ailment sent 20 to hospital
67.	DC		Graves	1991	White House	Lead pipes/paint
68.	DC		Legion	1991	SSA Payment Center	

89868Z050Z

69.	DC		SBS	1989	Parklawn Building, U.S. Dept. of HHS	
70.	DC		SBS, Legion	1989	Madison Building, Library of Congress	Tests ordered
71.	DC		SBS	1988	EPA Waterside Mall (Bahura v. SEW Investors)	New carpet; December 1993 bifurcated trial resulted in award of damages to 5 plaintiffs by jury; twelve plaintiffs still awaiting trial
72.	DC		SBS	1989	U.S. Housing and Urban Development Building	
73.	DC		SBS	1989	Frances Perkins Building, U.S. Labor Dept.	
74.	DC		BRI	1986	Hubert Humphrey Office Building	25% developed hypersensitivity pneumonitis; leaking cafeteria pipes
75.	DC		SBS	1992	National Museum of American History, Smithsonian Institution	Asbestos fibers floating in corridors from ventilation system
76.	DC		SBS	1993	U.S. Information Agency (USIA) Library	Air was rendered unbreathable; inspection of Colonial parking garage, below revealed fan venting carbon monoxide straight into library; negotiations about who will move the vent and pay for it, is underway
77.	DC		SBS	1988	National Oceanic and Atmospheric Administration Building, No. 1	Complaints of headache, flu-like symptoms; inadequate ventilation system; presence of phenol found; 4 employees received workers' compensation for illnesses; considering improving ventilation and removing phenol
78.	FL		SBS	1990	(Stillman v. South Florida Savings & Loan)	Breach of contract case
79.	FL		SBS	1991	(Eagle-Picher Industries v. Cox)	Florida District Court
80.	FL	Bartow	SBS	1991	Imperial Polk County Judicial Complex (Polk County v. Barton-Malow Co. & W. Wade Setliff)	300 have filed workers' comp claims; mold, high humidity, faulty air conditioning system; \$18 million lawsuit filed against contractors; employees readying suit against County and others; new roof required; cost to fix building estimated at \$22.5 million; ventilation system to be replaced
81.	FL	Brooksville	SBS	1992	Hernando County Courthouse	Inadequate ventilation, leaky roof, sagging ceilings, moldy walls and carpets; county to begin \$2 million renovation; employees want to be moved out
82.	FL	Dade City	SBS	1992	Eastside County Courthouse	Need to improve HVAC maintenance
83.	FL	Deerfield Beach	SBS	1991	House of Insurance	Complaints filed

698602050Z

84.	FL	Deland	BRI	1983	Deland Courthouse	Judge experiences vertigo; is hospitalized; mold growths, wetness problems, poor ventilation; county seeking \$250,000 to repair roof and air-conditioning system
85.	FL	Deland	SBS	1987	Volusia County Courthouse	Workers complain of respiratory tract problems; mold, mildew on walls, ceilings and in air duct system; many areas have poor ventilation, high carbon dioxide levels; plan to replace roof and air conditioning system
						By 1994 five circuit court employees intend to sue; whole building to be evaluated
86.	FL	Ft. Lauderdale	SBS	1988	<u>Goldman v. Broward County</u>	Workers' Compensation
87.	FL	Ft. Lauderdale	SBS	1991	South Florida Savings Bank (<u>Zandman v. Atria, et al.</u>) (Five additional cases filed)	Nine defendants; destroyed immune systems
88.	FL	Ft. Lauderdale	BRI	1991	Broward County School (<u>Rosenfeld v. School Board of Broward County</u>)	Paint fumes
89.	FL	Ft. Lauderdale	SBS	1991	Broward County Library	Complaints filed
90.	FL	Ft. Lauderdale	SBS	1991	Paragon Building	Complaints filed
91.	FL	Ft. Lauderdale	SBS	1991	Broward County Airport Control Center	Complaints filed
92.	FL	Fort Meade	SBS	1991	Fort Meade City Hall	Inadequate HVAC system; mold; mildew
93.	FL	Fort Pierce	SBS	1990	State Attorneys' Office Building	Improper HVAC caused mold/mildew build-up; employees have filed suit against St. Lucie County claiming permanent injuries
94.	FL	Gainesville	SBS	1986	Veterinary School, Univ. of Florida	Ventilation system; mold and organic chemical pollution
95.	FL	Gainesville	SBS	1992	Tacachale Community Building	Inadequate HVAC caused mold/mildew on walls and ceiling; building houses 50 mentally impaired patients
96.	FL	Gainesville	SBS	1992	Santa Fe Community College, Bldg. C	High humidity, mold, mildew
97.	FL	Gainesville	BRI	1992	Library West, Univ. of Florida	Chemical fumes; faulty ventilation
98.	FL	Hernando County	SBS	1992	J.D. Floyd Elementary School	Teachers and students have allergy-type symptoms; school was thoroughly cleaned and carpets replaced
99.	FL	Inverness	BRI	1993	Citrus Springs Elementary School	Students felt sick at school; respiratory complaints
100.	FL	Kissimmee	Legion	1992	The Hyatt - Orlando Hotel	Tests are pending; cases confirmed

2050239870

101.	FL	Largo	Legion	1994	Pinellas County Criminal Courts Complex Jail	2 people tested positive for Legionnaire's disease; bacteria were isolated in an air conditioning unit; bacteria found in a cooling tower on roof of maximum security facility; evacuations may be necessary
102.	FL	Lauderdale Lakes	SBS	1991	Lauderdale Lakes City Hall	Complaints filed
103.	FL	Lauderhill	SBS	1991	Lauderhill Mall, State of Florida Offices	Complaints filed
104.	FL	New Port Richey	SBS	1992	Westside County Courthouse	Need to improve HVAC maintenance
105.	FL	Oakland Park	SBS	1991	Northridge Medical Plaza, V.A. Clinic (Clavon v. Northridge Medical Plaza)	Dangerous mold in air
106.	FL	Oldsmar	SBS	1992	Oldsmar Elementary School	Moldy, moist air; school was closed for repairs; in 1993 school reopened
107.	FL	Orlando	BRI	1992	West Orange High School	Amount of mold is 35 times higher than test results show; complaints include headaches, fatigue, sinus infections, coughing; due to inadequate and/or poorly operating air-conditioning
108.	FL	Orlando	BRI	1992	Cypress Creek High School	IAQ problems
109.	FL	Orlando	BRI	1992	Walker Middle School	IAQ problems
110.	FL	Orlando	BRI	1992	Liberty Middle School	IAQ problems
111.	FL	Orlando	BRI	1992	Chickasaw Elementary School	IAQ problems
112.	FL	Orlando	BRI	1992	Blankner Elementary School	IAQ problems
113.	FL	Orlando	BRI	1991	Palmetto Elementary School	Teacher diagnosed with chronic fungal sinusitis; air in buildings tainted by chemical vapors, molds, and poor ventilation
114.	FL	Orlando	SBS	1993	Hyatt-Regency International Airport Hotel	Mildew present in 159 of its 445 rooms; clean up is planned
115.	FL	Orlando	SBS	1993	Orange County Government Building	Almost a dozen workers have been affected; solution estimated at millions of dollars; 10 workers were awarded disability - 2 permanent; health officials say Florida is nation's "sick building" capital; ventilation system inadequate
116.	FL	Palm Bay	SBS	1993	Discovery Elementary School	"Flu-like" symptoms; clean up of air conditioning system; burning eyes, upper respiratory problems, "onion-type" odor may be due to sulfate
117.	FL	Palm Harbor	SBS	1992	Curlew Creek Elementary School	Mold and mildew from high humidity levels; IAQ firm recommended new carpet, upgrading

						HVAC and more frequent cleaning; six teachers have received workers' compensation due to respiratory problems from poor IAQ
118.	FL	Pensacola	SBS	1990	Escambia County Dept. of Public Health	Mold, mildew and poor ventilation
119.	FL	Port St. Lucie	SBS	1989	Bayshore Elementary School	Inadequate HVAC; students and teachers symptomatic
120.	FL	St. Petersburg	SBS	1992	J.D. Floyd Elementary School	Carbon dioxide levels exceeded industry standards; bacteria and humidity at unacceptable levels; air-conditioning thermostats malfunctioned
121.	FL	St. Petersburg	SBS	1993	River Ridge School	Teachers complain of runny noses, nasal congestion, and odors; 2 buildings in question; ventilation system targeted
122.	FL	St. Petersburg	SBS	1993	Bloomington High school	Students and staff complained of persistent odor; reports of headaches, nausea and allergies; spending \$2 million for dehumidifying, cleaning air conditioning ducts
123.	FL	St. Petersburg	SBS	1993	Gaither High School	Attempts to improve air quality due to complaints by students and staff
124.	FL	St. Petersburg	SBS	1993	Pinellas County School	Closed school after investigating complaints; determined that air quality posed a health problem
125.	FL	Spring Hill	SBS	1992	Pine Grove Elementary School	School was scrubbed, caulked, carpet replaced and drainage system changed
126.	FL	Stuart	SBS	1989	Martin County Courthouse Complex	Mold, algae, fungus in air conditioning ducts; 10 treated at hospital; toxic fungi discovered in late 1992; building closed; dozens being tested for health problems; "lawsuits are flying"
						By 1993, 200 people complained; contaminated air conditioning system; leaks in roof; 21 employees filed claims; building closed
						In 1994, construction underway to replace building's exterior envelope, roof, all interior surfaces and all air handling units
127.	FL	Tallahassee	SBS	1992	Doyle Carlton Building	Chemical fumes from building clean-up
128.	FL	Tampa	SBS	1992	Hillsborough County Crisis Center	Dirty ventilation ducts; closed fresh-air intakes; high carbon monoxide levels

2050239872

129.	FL	Tampa	SBS	1992	University Community Hospital	OSHA investigated following 20 IAQ complaints; cause undetermined
130.	FL	Tampa	SBS	1989	Office of Disability Determination	Pigeon skeletons and bird droppings found in ventilation system
131.	FL	Tampa	SBS	1992	George Edgecomb County Building	Violation of air quality standards; cited by state
132.	FL	Tampa	Legion	1993	Lockhart Elementary School	Suspected legionella; investigations are on-going; pigeons may be a source of problem In 1994, consultants are still monitoring school
133.	FL	University Station	SBS	1991	John and Grace Allen Administration Building University of South Florida	Inadequate ventilation; water damaged carpets and ceiling tile; 77 have filed workers' comp claims; NIOSH investigated
134.	FL	West Palm Beach	SBS	1991	City Hall	Undersized fresh air intakes
135.	FL	West Palm Beach	SBS	1991	Palm Beach County Governmental Center	Complaints filed
136.	FL	Ybor City	SBS	1991	Lozano Building Hillsborough County Environmental Protection Commission	High carbon dioxide levels, inadequate ventilation; termite infestation creating a dust problem
137.	GA		SBS	1990	Administration Building, University of Georgia	NIOSH investigated, found mold, low humidity and inadequate ventilation; building is smoke-free
138.	GA	Atlanta	SBS	1980	101 Marietta Tower Bldg.	Dust and humidity; NIOSH investigated
139.	ID		SBS	1988	North Idaho College, Hedland Vocational Building	Fumes entering ventilation system and circulating throughout building from shop classroom
140.	ID	Boise	BRI	1994	Idaho Ice Arena	Five hockey players hospitalized -- from inhaling poisonous fumes from ice-shaving machine; 22 others treated then released; rink closed to check ventilation system; lawsuits pending
141.	IL	Chicago	SBS	1991	Wrigley Building	Ventilation system; exhaust from boats docked below building
142.	IL	Chicago	Legion	1991	Social Security Administration Bldg.	Bacteria found; evaluated after outbreak in Richmond, CA
143.	IL	Chicago	SBS	1992	Cook County Vital Statistics Bureau	Poor ventilation, paper mites in basement; workers complaining of rashes, respiratory problems

144.	IL	Chicago	SBS	1993	Chicago's Daley Center	Cancer-causing chemicals found in soot spewing from air vents; complaints of asthma, bronchitis, dizziness, nausea and fatigue; problem result of a faulty boiler; benzopyrene and benzantracene identified
145.	IL	Chicago	BRI	1993	Hinsdale Hospital (Elmwood Hall)	Hospital employees complain of burning in sinuses and ears; emergency room care required; faulty ventilation
146.	IL	Chicago	SBS	1993	St. Charles Community High School	Complaints of nausea, headaches and flu-like symptoms; ventilation problems
147.	IL	Chicago	Legion	1993	University of Illinois Hospital	Bacteria in facility's water system; transplant patient dies of Legionnaire's Disease
148.	IL	Chicago	SBS/Legion	1993	University of Illinois at Chicago (Education, Communications and Social Work Building)	Ventilation may be faulty; professor died of pneumonia; more than a dozen employees complained of feeling ill
149.	IL	Chicago	BRI	1994	Bolingbrook's Addams Middle School	Tests by industrial hygienists indicated hydrogen sulfide emitted from rooftop vents led to over 2 dozen students being hospitalized; ventilation system needs re-routing
150.	IL	Chicago	SBS	1982	Rolling Meadows Junior High School	5 cancer-related deaths of staff since 1982; medical experts hired to determine possible link to Plumgrove school deaths
151.	IL	DuPage	SBS	1993	GlenEllyn Elementary School	Formaldehyde and carbon dioxide detected in a portable unit; deficiency in ventilation system
152.	IL	St. Charles	SBS	1992	St. Charles Community High School	Grievance filed with teachers' union; IAQ tests showed high carbon dioxide levels, inadequate fresh air, high dust levels
153.	IL	Hanover Park	SBS	1993	Johnson School	Complaints from teachers and pupils; IAQ company to test for carbon dioxide, humidity levels
154.	IL	Hinsdale	SBS	1992	Hinsdale Middle School	Students experiencing illness; IAQ firm has been hired to evaluate; in 1993 recommend redirecting exhaust air ducts to discharge above roof be done
155.	IL	Hinsdale	SBS	1992	Lane Elementary School	Carpet emissions were blamed for illnesses; problems allegedly solved by cleaning carpets

2050239874

156.	IL	Palatine	SBS	1982	Plumgrove Junior High School	5 staff dead between 1982-1992; several developed breast cancer and some respiratory ailments during 1993-94; asbestos floor tiling and pipe insulation removed in 1993
157.	IL	Waukegan	BRI	1992	Lake County Health Department (Belvedere Medical Building)	Nurses report sinus problems and occasional shortness of breath; dust and mold in the ventilation system; cleaning of carpets and regular inspection of ventilation system will occur
158.	IL	Wheaton	SBS	1992	DuPage County Courthouse (<u>County of DuPage v. NOK et al.</u>) (<u>Bostick v. County of DuPage</u>)	Tests inconclusive; building newly constructed; 20 employees hospitalized; courthouse closed for repair; scheduled to reopen March 1993; county filed suit against architect and builders seeking \$5.5 million
159.	IN	Evansville	Legion	1985	St. Mary's Medical Center	
160.	IN	Indianapolis	Legion	1988	Methodist Hospital	10 cases, 5 deaths; water system
161.	IN	Kokomo	SBS	1990	Western Primary Elementary School	76% of students exhibited symptoms and transferred to another building; HVAC was replaced in mid-1992
162.	IN	Lebanon	Legion	1993	Harney Elementary School	Suspected Legionnaire's disease - related pneumonia of 17 students
163.	IN	Russiaville	SBS	1991	West Elementary School	HVAC; NIOSH investigated
164.	IN		BRI	1992	Indiana office complex	Change in insecticide used at adjoining warehouse, dirty ventilation system and inadequate air intakes; building was decontaminated
165.	IA	Iowa City	Legion	1981	University of Iowa Hospitals	"Water bug"; 24 cases
166.	IA	Ottumwa	SBS	1990	Wapello County and Iowa Depts. of Human Services Building (<u>Bloomquist v. Wapello County</u>)	Pesticides in carpet, HVAC inadequate, leaking sewer line
167.	KS	Belleville	BRI	1990	Agricultural Stabilization and Conservation Services; Soil Conservation Service (USDA Agencies) (<u>Dreeson v. WW Henry Co.</u>)	Carpet glue; cases dismissed
168.	KS	Wichita	SBS	1989	Pioneer TeleTechnologies	62 ill; tests inconclusive
169.	KY	Bowling Green	SBS	1988	Richardsville Elementary School	Inadequate ventilation and hog lot next door; high miscarriage rate